

Entropy and sodium intakes, the wicked problems of health sciences

By *Zoltan Sandor*

Created Sep 9 2013. Published on *Science 2.0* ([Home](#) > [Forums](#) > [Medicine](#))

http://www.science20.com/entropy_and_sodium_intakes_wicked_problems_health_sciences-120016

The Entropy is our fiercest enemy, and the salt is his perfect food.

Ignored (non-communicable) knowledges and bad education overall, and in the health science too. The law of entropy is the fiercest enemy of life and is our fiercest enemy too. The sodium-chloride isn't food for humans, but is the perfect food of entropy. The spontaneous diffusion of sodium ions into the cells and the diffusion of potassium ions out of the cells, enhances the entropy (the measure of disorder). And every mmol excess sodium and the wrong sodium/potassium ratio (and other wrong ratios) increases more the entropy in our body, in every cells. The task of the continuously working sodium-potassium pump to keep constant the intracellular concentration of Na and K ions. These cellular pumps continuously use energy of ATP molecules. "The activity of Na-K pump has been estimated to account for 20-40 % of the resting energy expenditure in a typical adult." (1) Some consequences of high sodium intake; the specialists talk about these rarely or never: Higher energy requirements (energy expenditure) for Na-K pump and kidney. All the rest of our vital processes (functional processes of the cells) receive less energy - because the metabolic rate (speed and capacity of enzyme reactions, oxygen supply, etc.) is limited. And the excess sodium intake do not increase the oxidative pathway. But, a critical surplus switches the anaerobic glycolysis on, in our every cells. This can be named: Sodium-Induced Cellular Anaerobic Glycolysis (SICAG). I think (it is logical) this is a very old anaerobic cellular mechanism, before free oxygen on Earth. We produce lactic acid in our every cells. Consequently, all of our vital processes and organs work worse (our heart, brain, regulating systems, immune system, etc.), and our cells are dying. Remains less energy for the regeneration. We burn the candle on both of his ends (aerobic and anaerobic). The average lifetime of our cells shortens. Soon (faster) the telomeres run out. Our aging accelerates. We get sick often and we will die soon. Logical consequence; the unnecessary sodium increases the incidence of all illnesses. Searching in 12 book set of Dietary Reference Intakes (more than 5000 pages, and about 600 references in the chapter; Sodium and Chloride) no hits for entropy, and the sodium-potassium pump is only some empty phrases. (2) The blind watchmaker learned well the physics first, then the chemistry, and dealt with biochemistry then only. But he never forgot what he learned already once. The optimal Na/K ratio and the ratio between sum of alkaline metals and sum of polyvalent metals, and the ratio between alkaline metals and energy content, etc. is in the human milk. From every viewpoint, the human milk is an evolutionary perfect food, including the minimal energy expenditure of the Na-K pump and kidney of the babies (= possible minimum entropy-transfer into the babies = the baby is growing healthily and with maximal economicalness). Thus, the human milk is the perfect guide to calculate the optimal adult intakes. Unfortunate, that these exist only in traces, in the scientific literature. And in some articles, even the traces are concealed. This is the real wicked problem of health sciences, and this is wronger than malignant neglect. I collected the most important evidences (the traces, and lack of the traces) of the above ones. Let us see it in a logical and nearly chronological order.

1965. Klahr & Bricker: Energetics of Anaerobic Sodium Transport by the Fresh Water Turtle Bladder. (3) I quote from this: "The rate of anaerobic glycolysis, as determined by lactate formation, correlates well with the rate as determined by glycogen utilization. Using lactate formation as the index of anaerobic glycolysis, a linear relationship was observed between glycolysis and net anaerobic sodium transport." Oops, sodium transport, anaerobic glycolysis and lactic acid, in 1965!

And 35 years later, 2000. Therien and Blostein: INVITED REVIEW - Mechanisms of sodium pump regulation. (4)

I don't quote from this, because are 362 references in the article, but nothing about the anaerobic glycolysis and lactic acid. Why?

And 40 years later, 2005. Christopher B Scott: Review, Contribution of anaerobic energy expenditure to whole body thermogenesis. (5)

Some quotations from this: "Entropy represents energy that is not available to perform work so that simply put, energy transfer is inefficient. ... Brisk activity of the sodium pump necessitates a rapid rate of ATP re-synthesis. If this is true then it is important to recognize that in some cells lactate with presumed heat production is better correlated with sodium and potassium pumping than is oxygen uptake. ... It seems logical to conclude that most mammalian energy expenditure does come from aerobic metabolism but the evolution of a metabolic acceleration with concomitant heat production comes from both anaerobic and aerobic pathways. The relative contributions of each pathway to whole-body thermogenesis are not known."

This already something (entropy, sodium-potassium pump, anaerobic glycolysis and lactic acid, in one article) but not too much. The explanation of the correlations and the consequences are missing. Would this be the "progress" of the health science over 40 years? Why "in some cells" only? I think so, in every cells (generated by high sodium intakes) and this is the cruel reality!

And 43 years later, 2008. Morrison et al.: Central control of thermogenesis in mammals. (6)

Again, I don't quote from this, because ~ 180 references are in the article, but nothing about the entropy, (floor gas) Na-K pump, anaerobic glycolysis and lactic acid. How can the knowledge (which was found already once or more) disappear?

1985. Henningsen: The sodium pump and energy regulation: some new aspects for essential hypertension, diabetes II and severe overweight. (7)

Again I quote (the abstract): "There is a growing evidence for that in modern societies the function of the cellular sodium-potassium pump (membrane-bound Na⁺ K⁺ ATPase) in several tissues in man cannot respond adequately to demands. This is not seen in any other free-living vertebrates on this earth. The clearly unphysiological very high intake of sodium-chloride (salt) and also alcohol is definitely playing an important role in the development of the common degenerating metabolic aberrations, e.g. essential hypertension, diabetes II and severe overweight, in man. The special and overall important role of the sodium-potassium pump for optimal cellular function and regeneration with special reference to the vascular tissues is presented and discussed."

Oops, the floor gas sodium-potassium pump (anaerobic turbo pump) is not enough, our cells are dying. And this was clear in 1985!

1991. Nedergaard et al.: Acid-induced death in neurons and glia. (8)

From the article: "Cerebral hypoxia-ischemia induces lactic acid formation through the accentuation of anaerobic glycolysis. The magnitude of this lactic acid accumulation depends largely upon the preischemic glucose and glycogen concentrations of the affected tissue (Smith et al., 1986). Local accumulation of lactic acid to cytotoxic levels may play a causal role in the genesis of brain infarction following cerebral ischemia (Meyerand Yamaguchi, 1977; Siemkowitz and Hansen, 1978; Pulsinelli et al., 1982; Nedergaard, 1987). Several authors have addressed directly the issue of acid-induced cell death."

And the excess sodium intake (floor gas Na-K pump) also induces lactic acid formation by switching the anaerobic glycolysis (SICAG) on. And our cells are dying, even in our brain. The salted humanity degenerates and will be idiotic.

2001. Osaka et al.: Thermogenesis induced by osmotic stimulation of the intestines in the rat. (9)

Some details from the article (here are some concealed traces): "The energy expenditure induced by 20 % glucose was 2.79 +/- 0.45 kJ kg⁻¹ for 3 h (Fig. 4). The RER (respiratory exchange ratio) increased from 0.82 +/- 0.01 to 0.92 +/- 0.01 at 115 min (Fig. 1B), suggesting the oxidation of carbohydrate ... The metabolic rate rose during the 10 min infusion period of 3.6 % NaCl, stayed at a plateau level of ~ 205 J

kg \cdot 0.75 min $^{-1}$ between 35 and 120 min and then slowly declined but was still significantly higher than the baseline level at 3 h. The energy expenditure induced by 3.6 % NaCl was 3.49 \pm 0.33 kJ kg \cdot 0.75, ... The RER did not change after infusion of any of the NaCl solutions (Fig. 2B)."

These results proves clearly, the excess salt intake (the higher energy expenditure of the Na-K pump and kidney, against entropy) do not increase the oxidative pathway, in rats. (I notice it: the decrease would be logical? Yes, it is logical consequence of the sodium-induced disorder. And I think, the decrease is fact!) But a critical surplus switches the anaerobic glycolysis on, and produces lactic acid in every cells. We can calculate that this anaerobic energy (ATP) production consumed more glucose (from the glycogen reserve) than the total resting metabolism of the rats, on the oxidative pathway. Despite, that this anaerobic excess isn't more than (about) 10-15 % of the total resting metabolism of the rats. And after the infusion of the highest dose of salt, 3 hours was not enough to return to the baseline level (to the level of resting metabolism). This is a real Sodium-Induced Cellular Anaerobic Thermogenesis (SICAT) or SICAG. From the effects of 0,9 % and 1,8 % NaCl infusion, I can suppose, anaerobic glycolysis begin in an average 70 kg adult from \sim 6-7 g dose of salt. I would dare to bet, that this was examined in similar (but oral) human experiments already, but where are the results? Furthermore, from the above results roughly calculable: the salted humanity squanders the energy of at least 100 million tons of food annually, to get rid of the sodium swallowed unnecessarily. We overeat (devour), we get fat, we get sick, and we die, while millions are starving on Earth.

And 9 years later: 2010. Ram K. Mathur: Role of diabetes, hypertension, and cigarette smoking on atherosclerosis. **(10)**

From the article: "To determine the mechanism of thermogenesis, Osaka et al.[7-9] infused hypertonic solution of glucose, NaCl, ... The mechanism of thermogenesis is not clear. However, it may involve intestinal osmoreceptors. ... It is this thermogenesis that is responsible for the generation of atherosclerotic plaque."

From the end of the article: "Patients are advised to stay away from fatty foods, which obviously does not help because fatty meal is not the cause for atherosclerosis. Therefore, the researchers should first examine the cause of the disease before trying to cure it; otherwise, we will be treating symptoms rather than curing the disease itself. ... Finally, this field requires some broad theories and hypotheses explaining the involvement of foods, diabetes, hypertension, cigarette smoking, and others in the formation of atherosclerotic plaque. We have a mission but are lacking the vision. That is why we have not made any progress even though we have worked on it for more than 50 years."

In these two articles (Osaka et al. and Mathur) absolutely nothing about entropy, Na-K pump, anaerobic glycolysis and lactic acid. Bad education, oblivion or something else? 9 years and 45 years after Klahr & Bricker, and the mechanism of thermogenesis was not clear really, for the authors and editors? Or ...? The floor gas (anaerobic) sodium-potassium pump devours the energy (and we produce lactic acid), but it's not enough, and our cells are dying. We haven't enough energy, and we haven't enough time for the regeneration, because we enhances the entropy (by high salt intakes) in our every cells, day by day, again and again, the entropy devours our energy. All the rest of our vital processes (functional processes of the cells) receive less energy, and all of our organs and vital processes work worse (including our heart, brain, regulating systems, immune system, etc). This is responsible for the generation of atherosclerotic plaque. And this is responsible for the low physical activity. And this generates strong hunger (and thirst). We overeat and get fat. And indisputable consequence, that the unnecessarily swallowed excess sodium increases the incidence of all illnesses, without any exception, including even the genetic disorders, cancer, NCD's and infectious diseases. Some people will be obese others not, some become diabetes others not, some have high BP others not (or later), etc. We are not totally alike, but the entropy law finds our weak point, and ravages mainly there, but increases the disorder in every cells in our body (and other risk factors affect the individual consequences).

2005. Meneton et al.: Links between dietary salt intake, renal salt handling, blood pressure, and cardiovascular diseases. **(11)**

From the abstract: "The mechanisms by which dietary salt increases arterial pressure are not fully understood, but they seem related to the inability of the kidneys to excrete large amounts of salt. From an evolutionary viewpoint, the human species is adapted to ingest and excrete < 1 g of salt per day, at least 10 times less than the average values currently observed in industrialized and urbanized countries."

Is valuable the evolutionary viewpoint in the article, but 40 years after Klahr & Bricker and 20 years after Henningsen, why "not fully understood"?

2011. Dickinson et al.: Endothelial function is impaired after a high-salt meal in healthy subjects. (12)
From the article: "However, the mechanisms relating salt and endothelial dysfunction are still not clear."
26 years after Henningsen, why "still not clear"? The progress of the science has been stopped!

1998. Sandor Z.: Equivalency law in the metal requirement of the living organisms. (13)
This equivalency law is a simple chemical rule: The alkaline metal requirement (sodium + potassium) is chemically equivalent with that of polyvalent metals (calcium + magnesium + zinc + iron etc.). Because, is a strict chemical stoichiometrical rule of the cation exchange processes is that they proceed with the exchange of an equivalent amount of positively charged counter-ions. The counter-ions of the polyvalent metals in our body = Na + K. Less counter-ion = trouble, much counter-ion = trouble, very much counter-ion = catastrophe, especially together with lactic acid formation! The average metal content of the breast milk proves this law, surprisingly well. This law is a manifestation of the maximum economy principle. But the scientists do not deal with this fact.

2005. Yamawaki et al.: Macronutrient, mineral and trace element composition of breast milk from Japanese women. (14)
From the results of this article we can calculate our own optimal intakes, and main optimal ratios. (Although this is only one article, and there is not much one like this in the literature.) For example, the optimum of sodium for an adult is not more than 400-500 mg/day. And the optimal sodium:potassium (mass) ratio is approximately 1:4. The mammalian milks and the human milk are evolutionary perfect foods, we must use this knowledge!

2013. WHO Guideline: Sodium intake for adults and children. Geneva, World Health Organization (15)
Sodium intake printversion; on page 2 (10 of 56): "WHO recommends a reduction in sodium intake to control blood pressure in children (strong recommendation). The recommended maximum level of intake of 2 g/day sodium in adults should be adjusted downward based on the energy requirements of children relative to those of adults."

Why downward? Why not from mature human milk?

On page 3 (11 of 56): "Addressing the optimal ratio of sodium to potassium was outside the scope of this guideline; however, if an individual consumes the amount of sodium recommended in this guideline and the amount of potassium recommended in the WHO guideline on potassium intake, the ratio of sodium to potassium would be approximately one to one, which is considered beneficial for health [12]."

and on page 19 (27 of 56): "These recommendations do not address the optimal sodium to potassium ratio; however, if this guideline and the WHO guideline on potassium intake are achieved, the molar ratio of sodium to potassium would be approximately one to one."

Potassium intake printversion; on page 3 (11 of 52): "... however, if an individual consumes sodium at the levels recommended in the WHO guideline on sodium intake, and potassium as recommended in the current guideline, the ratio of sodium to potassium would be approximately one to one, which is considered beneficial for health [8]."

and on page 16 (24 of 52): "These recommendations do not address the optimal ratio of sodium to potassium; however, if this guideline and the WHO guideline on sodium consumption are achieved, the molar ratio of sodium to potassium would be approximately one to one."

[12] = [8] (this is a self-reference) = WHO Diet, nutrition and the prevention of chronic disease. Report of

a Joint WHO/FAO Expert Consultation. Geneva, World Health Organization (WHO), 2003 (16)

From this report, on page 90 (100 of 160): "Adequate dietary intake of potassium lowers blood pressure and is protective against stroke and cardiac arrhythmias. Potassium intake should be at a level which will keep the sodium to potassium ratio close to 1.0, i.e. a daily potassium intake level of 70-80 mmol per day. This may be achieved through adequate daily consumption of fruits and vegetables."

Why close to 1.0? Where is the exact (original) reference of this statement? Has it any traces of strength of evidence? From where did they pick this ratio out? I never saw such ratio in scientific literature and in mature human milk. Only in the colostrum is this molar ratio close to one to one, but this has an evolutionary explanation. The WHO misleads all of the humanity. This is not science, but charlatantry.

This is a typical pseudo-scientific method. How this may have been made again, in 2013? Five decades, and what did the scientific elite do meanwhile? And what they do now? Really, the progress of the science has been stopped! Global corruption and global censorship? I notice it; the 10th edition of RDA (1989) recommended for an adult 500 mg/day sodium. (17) And this was the best recommendation, but now this is ignored. So, the WHO recommend now for an adult 2 g/day of sodium and at least 3510 mg/day potassium. This excess sodium and the wrong Na/K ratio increases the entropy, and the (aerobic and anaerobic) energy consumption of sodium-potassium pump, and is fourfold - fivefold sodium load on the kidney. In Hungary, the real sodium intake could be 6-8 g/day! I know a "very good job", it's just the work of 4-5 men, or just of 12-20 men, day by day, until die. Are there volunteers?

Conclusions

In the health sciences it is not allowed to ignore the laws of the physics and the chemistry. We must use the already existing, ignored (forgotten or censored) knowledges, and we must to teach that to everybody. This is the duty of the scientific elite. The fats and the sugars are foods, and are sources of our energy. The excess sodium intake (above the optimum) and the extremely wrong ratios of metals enhance the entropy, and the entropy devours our energy. Our vital processes (functional processes of the cells) receive less energy, because our metabolic rate is limited. All of our organs and vital processes work worse. Consequently, the unnecessary sodium excess increases the incidence of all illnesses without any exception. Increase of physical activity doesn't save us (since, we hasn't enough energy to do it). Reducing the fat and sugar content of processed foods doesn't save us. The sonorous "reducing salt intake" programs doesn't help us. Only one solution exists. We must radically reduce the sodium(-chloride) content of processed foods, not by taxes, but by strict laws. On the other hand, it is necessary to reduce the tax of the spices and his price. The salt is the greatest blunder of the Homo Sapiens. Only the man nourishes the entropy in his own body. There are not free-living animals like this on this Earth. The entropy and the natural selection destroyed the such species. (The natural selection already has little effect to human genome, does not repair it already.) **The salted humanity genetically degenerates and will be idiotic. We must stop the putting salt. Otherwise - our fiercest enemy - the entropy destroys us.**

References:

1. Oregon State University, Linus Pauling Institute, Micronutrient Information Center, Sodium (Chloride) <http://lpi.oregonstate.edu/infocenter/minerals/sodium/>
2. DIETARY REFERENCE INTAKES <http://www.nap.edu/catalog/dri/>
3. Saulo Klahr and Neal S. Bricker: Energetics of Anaerobic Sodium Transport by the Fresh Water Turtle Bladder. J Gen Physiol. 1965 March 1; 48(4): 571-580 <http://europepmc.org/articles/PMC2195440/pdf/571.pdf>
4. Alex G. Therien and Rhoda Blostein: INVITED REVIEW - Mechanisms of sodium pump regulation. Am J Physiol Cell Physiol September 1, 2000 vol. 279 no. 3 C541-C566 <http://ajpcell.physiology.org/content/279/3/C541.full>
5. Christopher B Scott: Review, Contribution of anaerobic energy expenditure to whole body thermogenesis. Nutrition&Metabolism 2005, 2:14 <http://www.nutritionandmetabolism.com/content/2/1/14>
6. Shaun F. Morrison, Kazuhiro Nakamura and Christopher J. Madden: Central control of thermogenesis in mammals. July 1, 2008 Experimental Physiology, 93, 773-797. <http://ep.physoc.org/content/93/7/773.full>

7. Henningsen N.C.: The sodium pump and energy regulation: some new aspects for essential hypertension, diabetes II and severe overweight. *Klinische Wochenschrift* 63 Suppl 3:4-8. 1985.
<http://www.ncbi.nlm.nih.gov/pubmed/2582182>
8. Maiken Nedergaard, Steven A. Goldman, Smita Desai, and William A. Pulsinelli: Acid-induced death in neurons and glia. *The Journal of Neuroscience*, August 1991, 11(8): 2489-2497
http://facweb.northseattle.edu/csheridan/Biology160_Win11/pdfs/Flow%20of%20Energy_04_Acid-Induced%20Cell%20Death.pdf
9. Toshimasa Osaka, Akiko Kobayashi, and Shuji Inoue: Thermogenesis induced by osmotic stimulation of the intestines in the rat. *J Physiol*. 2001 April 1; 532(Pt 1): 261–269.
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2278526/>
10. Ram K. Mathur: Role of diabetes, hypertension, and cigarette smoking on atherosclerosis. *J Cardiovasc Dis Res*. 2010 Apr-Jun; 1(2): 64–68. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2945206/>
11. Meneton P, Jeunemaitre X, de Wardener HE, MacGregor GA.: Links between dietary salt intake, renal salt handling, blood pressure, and cardiovascular diseases. *Physiol Rev*. 2005 Apr; 85(2):679-715.
<http://www.ncbi.nlm.nih.gov/pubmed/15788708> <http://physrev.physiology.org/content/85/2/679.long>
12. Kacie M Dickinson, Peter M Clifton, and Jennifer B Keogh: Endothelial function is impaired after a high-salt meal in healthy subjects. *Am J Clin Nutr* March 2011 vol. 93 no. 3 500-505
<http://ajcn.nutrition.org/content/93/3/500.full>
13. Sandor Z.: Equivalency law in the metal requirement of the living organisms. *Acta Alimentaria* 27 (4): 389-395. 1998.
<http://padre.uw.hu/ekvis/eqlaw.htm>
and in hungarian: <http://padre.uw.hu/ekvis/ekvitorv.html>
14. Yamawaki N, Yamada M, Kan-no T, Kojima T, Kaneko T, Yonekubo A.: Macronutrient, mineral and trace element composition of breast milk from Japanese women. *J Trace Elem Med Biol*. 2005; 19(2-3): 171-81. Epub 2005 Oct 24. Source Nutrition Research Institute, Meiji Dairies Corporation, 540 Naruda, Odawara, Kanagawa 250-0862, Japan.
<http://www.ncbi.nlm.nih.gov/pubmed/16325533>
<http://www.sciencedirect.com/science/article/pii/S0946672X05001008>
15. WHO issues new guidance on dietary salt and potassium
http://www.who.int/mediacentre/news/notes/2013/salt_potassium_20130131/en/
http://www.who.int/entity/nutrition/publications/guidelines/sodium_intak...
http://www.who.int/entity/nutrition/publications/guidelines/potassium_in...
16. WHO Diet, nutrition and the prevention of chronic disease. Report of a Joint WHO/FAO Expert Consultation. Geneva, World Health Organization (WHO), 2003
http://whqlibdoc.who.int/trs/WHO_TRS_916.pdf
17. Recommended Dietary Allowances 10th ed., National Academy Press, NW, Washington DC. 1989
<http://www.nap.edu/openbook.php?isbn=0309046335>
More related references: <http://padre.uw.hu/ekvis/entropyobesity.htm>
- Zoltan SANDOR
Institute of Materials and Environmental Chemistry, Research Centre for Natural Sciences, Hungarian Academy of Sciences
E-mail: sandor.zoltan @ ttk.mta.hu <http://www.ttk.mta.hu/en> <http://padre.uw.hu/index.html>
Padre (Z. Sandor)

Comments

29 November 2013 - 12:23pm #1 [Zoltan Sandor](#)

Nutrition Policy Rethink - The Body Controls Salt Intake, Restrictions Aren't Needed
<http://www.science20.com/print/118984>

The original article:

18. David A. McCarron, Alexandra G. Kazaks, Joel C. Geerling, Judith S. Stern and Niels A. Graudal:

Normal Range of Human Dietary Sodium Intake: A Perspective Based on 24-Hour Urinary Sodium Excretion Worldwide

Am J Hypertens (2013) doi: 10.1093/ajh/hpt139

<http://ajh.oxfordjournals.org/content/early/2013/08/23/ajh.hpt139.full>

From the abstract: "As documented here, this range is determined by physiologic needs rather than environmental factors. Future guidelines should be based on this biologically determined range."

From the end of the article: "Although the recent IOM report did not define "excessive" sodium intake or comment on what constituted a normal range, these data, which were presented to the IOM committee, address that critical assessment. Based on our data and the wide array of published data from the basic sciences through clinical investigation cited herein, it is reasonable to conclude that a normal range for human sodium intake exists. If future guidelines are to be effective and feasible, they must be based on that scientific reality."

Stupidity. This does not work in us (already), we eat the salt. Opposite this - the urban mice abstain from the salt. The biologically determined range is in the breast milk, but the growing entropy (and we) will ruin it. Without entropy, and without (aerobic and anaerobic) energy expenditure of sodium-potassium pump, and without the metal content of human milk, and without an evolutionary viewpoint - this is not science. This is only a new touchstone of the meaningless, pseudo-scientific salt war's. This is the scientific reality!

Note: Editor-in-Chief of the American Journal of Hypertension is Michael H. Alderman. So, everything is clear. <http://www.nature.com/ki/journal/v71/n1/full/5001952a.html>

19. Niels Graudal: Commentary: Possible role of salt intake in the development of essential hypertension Int. J. Epidemiol. (October 2005) 34 (5): 972-974. doi: 10.1093/ije/dyi016

<http://ije.oxfordjournals.org/content/34/5/972.full>

From the end of the article: "It is tempting to end this commentary with another provocative citation from Chapman and Gibbons:1 'Many (articles) possess historical interest only. Others, while defective in some respects, contain suggestions that have led to later and more valuable work. Still others have had influence out of all proportion to their intrinsic work and are responsible for vast amounts of wasted research endeavour on the part of later investigators'. In that connection, considering that the salt controversy now is dealing with an effect size of about 1 mm Hg, one may ask, has it been worth 100 years of effort?"

Some older touchstones of the meaningless salt debate:

20. Gary Taubes: The (Political) Science of Salt, Science 14 August 1998: Vol. 281 no. 5379 pp. 898-907

<http://www.stat.berkeley.edu/users/rice/Stat2/salt.html>

<http://www.sciencemag.org/content/281/5379/898.short>

<http://www.sciencemag.org/content/281/5379/898.full>

From this article: "The salt controversy is the "number one perfect example of why science is a destabilizing force in public policy.""

My version: **The science of salt is the number one perfect example onto the blunders, mistakes and irresponsibilities of the modern health sciences.**

Please, write your related comment (knowledges, experiences or just your opinion or proposal) here, or as an independent post. **As scientists, we must do everything for the change, nobody can do it and nobody will do it, instead of us.**

Padre (Z. Sandor)

17 September 2013 - 6:38am #2 [Zoltan Sandor](#)

21. In 2013: <http://www.nrv.gov.au/nutrients/potassium.htm>

"... Given this interrelatedness, requirement for potassium depends to some extent on dietary sodium, however, the ideal sodium:potassium intake ratio is not sufficiently established to use in setting

requirements."

Why? They are adults, they forgot the breast milk.

22. And: <http://www.nrv.gov.au/nutrients/sodium.htm>

"There many healthy populations with estimated intakes of less than 40 mmol/day (Intersalt Cooperative Research Group et al 1988). Survival at extremely low levels such as that of the Yanomamo reflects the ability to conserve sodium by reducing urine and sweat losses. With maximal adaptation, the smallest amount of sodium needed to replace losses is estimated to be no more than 0.18 g/day (8 mmol/day). However, a diet providing this level of sodium intake is unlikely to meet other dietary requirements in countries such as Australia and New Zealand."

23. WHO, 2006.

http://www.who.int/dietphysicalactivity/reducingsaltintake_EN.pdf

From page 26 (31 of 61):

"Several national and international agencies recommend individual dietary sodium intakes of no more than 100 mmol/day (6 g salt/day) and in some cases no more than 65 mmol/day (4 g salt/day). Two WHO expert consultations recommended that the population average for salt consumption should be < 5 g/day (WHO, 1983; WHO/FAO, 2003). While well below the average salt consumption in most countries, this recommendation reflects a pragmatic compromise since well-conducted trials clearly indicate that even greater sodium reductions (to 50–60 mmol/day) would achieve greater health benefits. (Denton, 1982; WHO – International Society of Hypertension, 1999; Sacks et al, 2001; He&MacGregor, 2004) Additionally, numerous countries worldwide have set adequate intake levels for sodium. In Australia and New Zealand the adequate intake for adults for sodium was set at 460–920 mg/day (20–40 mmol/day) to ensure that basic nutritional requirements are met and to allow for adequate intakes of other nutrients (Nutrient Reference Values for Australia and New Zealand, 2005)."

This compromise is a pact with the enemy! The high sodium intake = we deliver weapons and ammunition for our fiercest enemy (the Law of Entropy). Who uses it without hesitation, against us.

From the DRI (2):

http://www.nap.edu/openbook.php?record_id=10490&page=265

"The Recommended Dietary Allowance (RDA) for carbohydrate is set at 130 g/d for adults and children based on the average minimum amount of glucose utilized by the brain. This level of intake, however, is typically exceeded to meet energy needs while consuming acceptable intake levels of fat and protein (see Chapter 11). The median intake of carbohydrates is approximately 220 to 330 g/d for men and 180 to 230 g/d for women."

3-4 liters of human milk contains: 227-303 g carbohydrates, 1990-2650 kilocalories energy, 405-540 mg sodium and 1410-1880 mg potassium. Source: Yamawaki et al. 2005. (14)

The much sugar or the much sodium is the reason of the diseases?

Padre (Z. Sandor)

15 September 2013 - 2:05pm #3 [Johannes Buhlmann](#)

Well, first, our lust for salt may be inherited from former times, when our ancestors could not get enough essential sodium by their hunter diet. So Marvin Harris says in "Our Kind", Harper&Row, New York 1977. Clear, that this inherited behaviour defect is consequently used to make money (e.g. to sell them salty things to eat, to say, make things more salty for more eating).

My question is as follows (because you know much about entropy in biologic organism): Would drinking water with relatively low entropy ease life's processes, e.g. polymerisation in any way? I've heard about Tobacco Mosaic Virus Protein Polymerisation, driven only by entropy. Would this polymerisation take place faster and more reliable, if the soluting water had a lower entropy? Entropy is an extensive

quantity, would it be an intensive as the temperature is, things would be clear.

By the way, if you need some low entropy water, see here:

<http://grnt.biz>

Regards.

12 November 2013 - 10:08am #4 [Zoltan Sandor](#)

I learned from biochemistry, we use about one third of our total energy expenditure against the entropy. But I know very little in fact about entropy in living organism.

"Would drinking water with relatively low entropy ease life's processes, e.g polymerisation in any way?"

I doubt this. Has placebo effect only (if has it). But presumably good business. The entropy (the disorder) is growing voluntarily, why would be left "relatively low" (on room temperature)?

The entropy slightly abstract thing, it is neglected because of this possibly.

"By the way, if you need some low entropy water, see here:"

I buy a bottle of vodka rather :-)

I found an open access journal: Entropy. Although not too much is the biology in it.

<http://www.mdpi.com/journal/entropy>

Padre (Z. Sandor)

4 November 2013 - 11:19am #5 [Zoltan Sandor](#)

24. Herman Pontzer, David A. Raichlen, Brian M. Wood, Audax Z. P. Mabulla, Susan B. Racette, Frank W. Marlowe: Hunter-Gatherer Energetics and Human Obesity

(2012), PLoS ONE 7(7): e40503. doi:10.1371/journal.pone.0040503

<http://dx.plos.org/10.1371/journal.pone.0040503>

and

<http://www.bbc.co.uk/news/science-environment-18985141>

From the article:

"We measured total daily energy expenditure (TEE, kCal/day) over an 11-day period in 30 Hadza adults (13 men ages 18–65, 17 women ages 18-75 .."

The abstract of the article:

"Western lifestyles differ markedly from those of our hunter-gatherer ancestors, and these differences in diet and activity level are often implicated in the global obesity pandemic. However, few physiological data for hunter-gatherer populations are available to test these models of obesity. In this study, we used the doubly-labeled water method to measure total daily energy expenditure (kCal/day) in Hadza hunter-gatherers to test whether foragers expend more energy each day than their Western counterparts. As expected, physical activity level, PAL, was greater among Hadza foragers than among Westerners. Nonetheless, average daily energy expenditure of traditional Hadza foragers was no different than that of Westerners after controlling for body size. The metabolic cost of walking (kcal kg⁻¹ m⁻¹) and resting (kcal kg⁻¹ s⁻¹) were also similar among Hadza and Western groups. The similarity in metabolic rates across a broad range of cultures challenges current models of obesity suggesting that Western lifestyles lead to decreased energy expenditure. We hypothesize that human daily energy expenditure may be an evolved physiological trait largely independent of cultural differences."

From the Introduction:

"By 2015, nearly one in every three people worldwide is projected to be overweight, and one in ten is expected to be obese [1]. The attendant health risks of being overweight or obese, including Type 2 diabetes, cardiovascular disease, and certain cancers, are well known [1]. The proximate cause of weight gain is energy imbalance, with food energy intake (kCal/day) exceeding total energy expenditure (kCal/day), but the societal causes of the global obesity pandemic remain a focus of debate [1]–[7].

Generally, rising obesity incidence is thought to result from the current Western lifestyle, in which activity levels and diet deviate substantially from the conditions under which our species' metabolic physiology evolved [2]–[6]. Some propose that modern conveniences and mechanization lead to decreased physical activity and lower energy expenditure in industrialized societies [1]–[3]. Others hypothesize that changes in diet and energy intake are responsible, citing the relatively recent increase in energy dense foods, particularly processed foods high in fructose and other simple sugars that can depress energy expenditure and increase appetite and adiposity [4]–[7]."

From the BBC news:

"This to me says that the big reason that Westerners are getting fat is because we eat too much - it's not because we exercise too little," said Dr. Pontzer.

I wrote about the salt and turbo Na-K pump for Dr. Pontzer (Aug. 8 2012). His reply was:

"Interesting hypothesis. I don't know of any work showing that salt content in the diet predicts energy expenditure, but it's worth a look. Probably someone has looked at high-sodium and low-sodium diets and the effect on metabolism."

I was searching and I found it. In fact, it was looked, but unfortunately, about this effect is very little information in the scientific literature. This work is an exceptionally important milestone on this area of the science. Proves it that better models necessary - and better strategies against obesity (and better strategies against all illnesses). **We (westerners) produce the same amount of energy, but we spend more on the war, against the entropy.**

25. Laura Dwyer-Lindgren, Greg Freedman, Rebecca E Engell, Thomas D Fleming, Stephen S Lim, Christopher JL Murray and Ali H Mokdad: Prevalence of Physical Activity and Obesity in US Counties 2001-2011: A Road Map for Action

Population Health Metrics 2013, 11:7 doi:10.1186/1478-7954-11-7

<http://www.pophealthmetrics.com/content/11/1/7>

Some sentences from the article:

"Our results showed an increase in the prevalence of sufficient physical activity from 2001 to 2009. Levels were generally higher in men than in women, but increases were greater in women than men. ... This increase in level of activity was matched by an increase in obesity in almost all counties during the same time period. ... Our study showed that increased physical activity alone has a small impact on obesity prevalence at the county level in the US. Indeed, the rise in physical activity levels will have a positive independent impact on the health of Americans as it will reduce the burden of cardiovascular diseases and diabetes. Other changes such as reduction in caloric intake are likely needed to curb the obesity epidemic and its burden."

Final conclusion

The education is wrong, the dissemination of scientific knowledge is wrong and the strategies against the illnesses are totally bad. The researchers are not thinking, the existing knowledge is not used (is ignored and censored), but statistical data are collected, and presented, for example, like this:

26. (The original article)

Ronald J. Iannotti, PhD and Jing Wang, PhD

Trends in Physical Activity, Sedentary Behavior, Diet, and BMI Among US Adolescents, 2001–2009

Pediatrics Published online September 16, 2013 doi: 10.1542/peds.2013-1488

<http://pediatrics.aappublications.org/content/early/2013/09/11/peds.2013-1488.full.pdf+html>

<http://pediatrics.aappublications.org/content/early/2013/09/11/peds.2013-1488.abstract>

And the presentations of this article:

US teens begin to slim down, study suggests

<http://medicalxpress.com/news/2013-09-teens-slim.html#nwl>

and

US teens have improved health behaviors, but BMI up

<http://medicalxpress.com/news/2013-09-teens-health-behaviors-bmi.html#nwl>

In the last five decades, the elite of the health science made experimental animals from the humanity, while - killed millions annually the sodium-induced disorder - the entropy. If this experimentation is continued - who can healing 10 billion genetically degenerated idiots?

Padre (Z. Sandor)

25 September 2013 - 5:52am #6 [Zoltan Sandor](#)

This article shows a very different topic, but perfectly fits to the big salted puzzle.

27. Pete C. Trimmer, James A.R. Marshall, Lutz Fromhage, John M. McNamara, Alasdair I. Houston

Understanding the placebo effect from an evolutionary perspective

Evolution&Human Behavior Volume 34, Issue 1 , Pages 8-15, January 2013.

(Received 13 September 2011; accepted 24 July 2012. published online 30 August 2012.)

[http://www.ehonline.org/article/S1090-5138\(12\)00070-0](http://www.ehonline.org/article/S1090-5138(12)00070-0)

and

<http://www.newscientist.com/article/mg21528812.300-evolution-could-explain-the-placebo-effect.html>

From the New Scientist:

"The results show a clear evolutionary benefit to switching the immune system on and off depending on environmental conditions."

And what does our self-adjusting system do if the "environmental condition" is the high sodium intake /Sodium-Induced Disorder Syndrome (SIDS)/ during in our whole life?

Energetics restrictions, and the incidence of the infectious diseases is growing.

Padre (Z. Sandor)

20 October 2014 - 7:36am #7 [Zoltan Sandor](#)

In our body, every minute 150-180 million red blood cells (and approximately, or at least 60 million other cells) are dying.

28. Chang Hyung Hong, MD, PhD, Cherie Falvey, MPH, Tamara B. Harris, MD, Eleanor M. Simonsick, PhD, Suzanne Satterfield, MD, DrPh, Luigi Ferrucci, MD, PhD, Andrea L. Metti, MPH, Kushang V. Patel, PhD, MPH and Kristine Yaffe, MD: Anemia and risk of dementia in older adults Findings from the Health ABC study

<http://www.neurology.org/content/81/6/528.short>

From the abstract:

"Among older adults, anemia is associated with an increased risk of developing dementia."

From the DRI (2):

"Important subclinical and clinical consequences of iron deficiency are impaired physical work performance, developmental delay, cognitive impairment, and adverse pregnancy outcomes. Several other clinical consequences have also been described."

and:

"Studies of iron deficiency anemia and behavior in the developing human and in animal models suggest persistent functional changes. Investigators have demonstrated lower mental and motor test scores and behavioral alterations in infants with iron deficiency anemia."

and:

"Almost two-thirds of iron in the body is found in hemoglobin present in circulating erythrocytes. A readily mobilizable iron store contains another 25 percent. Most of the remaining 15 percent is in the myoglobin

of muscle tissue and a variety of enzymes necessary for oxidative metabolism and many other functions in all cells. A 75-kg adult man contains about 4 grams of iron (50 mg/kg) while a menstruating woman has about 40 mg/kg of iron because of her smaller erythrocyte mass and iron store (Bothwell et al., 1979)."

http://www.nap.edu/openbook.php?record_id=10026&page=290

From the Medical Dictionary (29):

"Aged red cells are ingested by macrophages in the spleen and liver. The iron is transported by the plasma protein transferrin to the bone marrow, where it is incorporated into new red cells. The heme group is converted to bilirubin, a bile pigment secreted by the liver. About 180 million red blood cells are destroyed every minute. Since the number of cells in the blood remains more or less constant, this means that about 180 million red blood cells are manufactured every minute."

<http://medical-dictionary.thefreedictionary.com/erythrocyte>

And (30):

"Every second 2.5 million RBC's are destroyed. Although this represents only 0.00001 % of the total 25 trillion cells, these cells must be replaced if homeostasis is to be maintained."

and:

"Iron is removed from heme molecules in the phagocytes. The macrophages can store iron or release it to the blood. In the plasma, it binds to the protein transferrin and is carried to the bone marrow where the iron can be used to synthesize new hemoglobin. Excess iron can be stored in the bone marrow and liver. Some iron is lost in the bile. For this reason, we must take in some iron with our food."

http://faculty.ucc.edu/biology-potter/life_cycle_of_the_erythrocyte.htm

We have to replace all the destroyed cells, and we have to digest and recycle or excrete the residues. But everything work worse in every cells, because the excess sodium intakes, because the wrong Na/K ratio, because the wrong ratio between sum of alkaline metals and sum of polyvalent metals and because the lactic acid formation. The higher sodium ion concentrations (and higher hydrogen ion concentrations generated by SICAG) imbalance the cation exchange processes of iron (and other metals: Ca, Mg, Zn, Mn, Cu etc.). The function of metalloenzymes and of transport proteins is deteriorating, and really everything work worse in our body. Thus the high sodium intake is a basal cause of anemia, because the reproduction of red blood cells worsening, and by this way enhance the risk of dementia, and the cytotoxic effect of lactic acid heightens the risk, directly in the brain (and not only in older adults). Note: The sodium ions diffuses across the membranes of RBC's too and the floor gas Na-K pump devours the energy of these cells too, and shortens the average lifetime of them. The salt isn't the only chemical, with which we feed the entropy, we have many other problems. But the salt is the one, which has too many secret and censored knowledges.

31. Markus Kleinewietfeld, Arndt Manzel, Jens Titze, Heda Kvakan, Nir Yosef, Ralf A. Linker, Dominik N. Muller & David A. Hafler: Sodium chloride drives autoimmune disease by the induction of pathogenic TH17 cells

Nature 2013 doi:10.1038/nature11868

Received 13 March 2012, Accepted 19 December 2012, Published online 06 March 2013

<http://www.nature.com/nature/journal/vaop/ncurrent/full/nature11868.html>

From the article:

"There has been a marked increase in the incidence of autoimmune diseases in the past half-century. Although the underlying genetic basis of this class of diseases has recently been elucidated, implicating predominantly immune-response genes 1, changes in environmental factors must ultimately be driving this increase. ... Thus, increased dietary salt intake might represent an environmental risk factor for the development of autoimmune diseases through the induction of pathogenic TH17 cells."

and:

"Although we have recently elucidated many of the genetic variants underlying the risk of developing autoimmune diseases 1, the significant increase in disease incidence, particularly of multiple sclerosis and type 1 diabetes, indicates that there have been fundamental changes in the environment that cannot be related to genetic factors. Diet has long been postulated as a potential environmental risk factor for this increasing incidence of autoimmune diseases in developed countries over recent decades 3. One such dietary factor, which rapidly changed along with the Western diet and increased consumption of processed foods or fast foods, is salt (NaCl) 4, 5. The salt content in processed foods can be more than 100 times higher in comparison to similar home-made meals 5, 6."

And type 2 diabetes, Henningsen 1985 (7), caused insulin resistance by anaerobic turbo (floor gas) metabolism of glucose (glycogen -> glucose -> lactic acid, and backwards).

32. Richard Lynn, John Harvey: The decline of the world's IQ
Intelligence Volume 36, Issue 2, March–April 2008, Pages 112–120
<http://www.sciencedirect.com/science/article/pii/S0160289607000463>
<http://dx.doi.org/10.1016/j.intell.2007.03.004>

33. Michael A. Woodley, Jan te Nijenhuis, Raegan Murphy:
Were the Victorians cleverer than us? The decline in general intelligence estimated from a meta-analysis of the slowing of simple reaction time
Intelligence Available online 7 May 2013
<http://www.sciencedirect.com/science/article/pii/S0160289613000470>
<http://dx.doi.org/10.1016/j.intell.2013.04.006>

I suppose strongly, together with the IQ the average moral level decreases, and all this - will accelerate. And this disintegrates our society. Indisputable consequences: the high sodium intake (the sodium-induced disorder syndrome) and the lack of the natural selection and other risk factors ruins our health, our brain, our genome and our civilisation.

34.
<http://www.dailymail.co.uk/sciencetech/article-2307418/Professor-Stephen-Hawking-plea-space-exploration-claims-humans-survive-1-000-year-fragile-planet.html>
"World-renowned physicist Stephen Hawking today said humanity would not last another 1,000 years on Earth."

35.
<http://www.radiotimes.com/news/2013-09-09/david-attenborough-i-dont-ever-want-to-stop-work>
"I think that we've stopped evolving. ... We stopped natural selection as soon as we started being able to rear 95–99 per cent of our babies that are born. We are the only species to have put a halt to natural selection, of its own free will, as it were. ... Stopping natural selection is not as important, or as depressing, as it might sound – because our evolutionary process is now cultural."
But the sad reality is that we started our devolution, which will accelerate as in a nuclear bomb the chain reaction. And nobody will be able to stop it.

In Hungary, grows drastically the number of diabetic children. Between 1992 and 2012 the type 1 diabetes grew from 9 to 18 from among 100 thousand children. Source:
<http://www.origo.hu/egeszseg/20120405-naponta-7-magyar-cukorbeteg-amputalnak.html>

Oops, the censorship was inattentive! Usable data were published. Calculable, that all Hungarian children will be diabetes 1 after ~ 250 years (if this rate remains constant). But this is only one of the parallelly growing diseases. And will accelerate. Maybe, we die out within 250 years.

"The number of people with diabetes is increasing in every country." Source:

<http://www.idf.org/worlddiabetesday/toolkit/gp/facts-figures>

In relation to Robert Walker's article:

http://www.science20.com/robert_inventor/blog/why_didnt_ets_or_self_replicating_machines_colonize_our_solar_system_millions_years_ago-121358

If ET resembles us, he has similar problems, or he had similar problems. (Hopeless war against the entropy, overpopulation, food and energy deficiency, environmental pollution, crises, conflicts etc.) Possible, we can't find traces and signs of extraterrestrial civilisations because the entropy destroyed them before they were able to fly to distant solar systems. If this is the truth, we must worry, because our fate will be the same. And after us, only a few lonely Voyager remains in the galaxy. We must use existing knowledges and Occam's razor too if the statistical data are not enough. The race is on. We will be champions, or the entropy destroys us? I don't know the answer, but we have little chance to win, if we nourish the entropy longer in our own body. I remember a DDR sci-fi from the 70's: Die Ohnmacht der Allmachtigen

Padre (Z. Sandor)

29 November 2013 - 11:31am #8 [Zoltan Sandor](#)

Some new pieces of the gigantic salted puzzle

36. Apicella, C. L., Azevedo, E. A., Fowler, J. A. & Christakis, N. A.: Isolated hunter-gatherers do not exhibit the endowment effect bias. *American Economic Review*, (Forthcoming).

The full article is available from here:

<http://www.corenapicella.com/publications>

Quote from here:

http://www.science20.com/news_articles/hadza_huntergatherer_society_lacks_western_endowment_effect-123305

Apicella said. "Either way the results suggest that these isolated hunter-gatherers are more rational than the average western consumer when it comes to economic decisions."

The evolution of the isolated hunter-gatherer populations has not been stopped, and they are not salted. But unfortunately they are too little populations. And the developed countries will integrate them :-(

http://www.science20.com/news_articles/creativity_decline-124573

Original source **37.**:

<http://www.washington.edu/news/2013/11/14/a-decline-in-creativity-it-depends-on-how-you-look/>

(The paper will be published in *Creativity Research Journal* in January 2014.)

The result shows a shift from the rational function, towards the irrational function of the brain, and this correlates well with the decline of world's IQ. And is also a consequence of the growing entropy (in our brain). And is a consequence of our devolution.

38. Children's cardiovascular fitness declining worldwide

American Heart Association Meeting Report: Abstract 13498

<http://newsroom.heart.org/news/childrens-cardiovascular-fitness-declining-worldwide?preview=989f>

"We need to help to inspire children and youth to develop fitness habits that will keep them healthy now and into the future," Tomkinson said.

Bad strategy and useless guide - they do not have enough energy, because the entropy devours it. This decline is a logical consequence of our devolution. And is factual consequence of growing entropy. And this is one of the symptoms of the Sodium-Induced Disorder Syndrome.

39. Whiting DR, Guariguata L, Weil C, Shaw J:

IDF diabetes atlas: global estimates of the prevalence of diabetes for 2011 and 2030.

Diabetes Research and Clinical Practice [2011, 94(3):311-321]

<http://europepmc.org/abstract/MED/22079683>

<http://www.sciencedirect.com/science/article/pii/S0168822711005912>

From the Fox News:

<http://www.foxnews.com/health/2013/11/14/diabetes-battle-being-lost-as-cases-hit-record-382-million/>

"The world is losing the battle against diabetes as the number of people estimated to be living with the disease soars to a new record of 382 million this year, according to a new report from the International Diabetes Federation (IDF). ... 'Year after year, the figures seem to be getting worse', said David Whiting, an epidemiologist and public health specialist at the federation. All around the world we are seeing increasing numbers of people developing diabetes. He said that a strategy involving all parts of society was needed to improve diets and promote healthier lifestyles."

This "losing the battle" proves that the strategies are bad! And this is a consequence of ignored Sodium-Induced Disorder Syndrome, which was censored over decades so effectively, that did not have a name.

And **40.**:

http://en.wikipedia.org/wiki/Diabetes_mellitus_type_2

"Rates of type 2 diabetes have increased markedly over the last 50 years in parallel with obesity: As of 2010 there are approximately 285 million people with the disease compared to around 30 million in 1985."

1985 is the year of Henningsen's forgotten article.

Padre (Z. Sandor)

13 December 2013 - 12:10pm #9 Zoltan Sandor

Back to Osaka et al. (9)

"The metabolic rate (M; in kJ) was calculated from measurements of O₂ consumption and CO₂ production according to the following equation: $M = 15.8[O_2] + 5.2[CO_2]$ (Kurpad et al. 1994), where [O₂] and [CO₂] are in litres at standard temperature and pressure. Values were corrected for metabolic body size (kg 0.75). The amount of energy expenditure induced by infusion of a solution was calculated as the total area of increase in metabolic rate over resting values."

But the oxygen consumptions (which are better than the RER) were not published. Why? And what is the situation with the anaerobic energy production? How did they calculate it? Interesting questions, but Mr. Osaka did not answer my e-mail. **The censorship's fingerprints are clearly recognisable. However this is a very valuable and very important work.** Possible consequence of the wrong education - maybe - only a few people able to understand this. But nobody uses this.

Back to Dickinson et al. (12)

"Overall FMD (flow-mediated dilatation) was reduced 2 h postprandially. FMD was significantly more impaired after the HSM (high-salt meal) than after the LSM (low-salt meal) at 30 min ..."

"An HSM (65 mmol Na = 3.8 g NaCl), which reflects the typical amount of salt consumed in a commonly eaten meal, can significantly suppress brachial artery FMD within 30 min. These results suggest that high salt intakes have acute adverse effects on vascular dilatation in the postprandial state."

"We speculate that one of these possible mechanisms by which salt impairs endothelial function is via an alteration in plasma sodium. Two studies have reported responses to oral salt loading over a postprandial time period, which showed a rise in plasma sodium in response to 100 mmol Na (5.8 g salt) loading in healthy persons of 3 mmol/L, which occurred within 2–3 h of consuming the test meal [16, 17]. It has been postulated that a high salt intake may acutely impair vascular function by raising plasma sodium by as much as 3 mmol/L."

"It appears that higher salt intakes have acute adverse effects on vascular dilatation in the postprandial phase."

But 46 years after Klahr & Bricker (3) nothing about the floor gas Na-K pump, lactic acid, etc. in the article. It is fact, the salt has many acute adverse effects. But this is neglected and is censored very efficiently in the scientific literature and in the education. Why?

Because these adverse effects are very frightening. And because ...??

Padre (Z. Sandor)

20 January 2014 - 11:30am #10 Zoltan Sandor

41. Peskind ER, Jensen CF, Pascualy M, Tsuang D, Cowley D, Martin DC, Wilkinson CW, Raskind MA.: Sodium lactate and hypertonic sodium chloride induce equivalent panic incidence, panic symptoms, and hypernatremia in panic disorder.

Biol Psychiatry. 1998 Nov 15; 44(10):1007-16.

<http://www.ncbi.nlm.nih.gov/pubmed/9821565>

<http://www.sciencedirect.com/science/article/pii/S0006322398000535>

"Abstract

BACKGROUND: Although experimental induction of panic by infusion of 0.5 mol/L sodium lactate (NaLAC, 500 mEq sodium/L) in persons with panic disorder was described three decades ago, the mechanism underlying this observation remains unclear. Here we asked if the rapid administration of the large sodium load contained in the 0.5 mol/L sodium lactate infusion might be involved in panic induction. METHODS: We compared in panic disorder and healthy subjects behavioral, electrolyte, endocrine, and acid-base responses to three double-blind randomly ordered equal volume 20-min infusions: 0.5 mol/L sodium lactate, hypertonic saline (3% sodium chloride, 513 mEq sodium/L), and normal saline (NS, 0.9 % sodium chloride, 154 mEq sodium/L) placebo. RESULTS: Sodium lactate (0.5 mol/L) and hypertonic saline (HS) produced the same high incidence of panic and equivalent increases in panic symptoms, serum sodium, and plasma vasopressin in the panic disorder subjects. Neither hypertonic infusion increased cortisol or adrenocorticotropin. No normal subject experienced panic in any condition. The 0.5 mol/L sodium lactate infusion induced alkalosis, whereas hypertonic saline and normal saline induced a mild acidosis. CONCLUSIONS: Hypertonic sodium solution containing either chloride or lactate anion induces panic in panic disorder. The large sodium loads delivered by hypertonic saline and 0.5 mol/L sodium lactate may be involved in the mechanism of panic induction."

From the article:

"Specifically, we asked whether equally large sodium loads administered as either a lactate-free HS infusion (3% sodium chloride) or a standard 0.5 mol/L NaLAC infusion would produce the same incidence of panic, pattern of panic symptoms, elevations of serum sodium, and effects on plasma arginine vasopressin (AVP), adrenocorticotropin (ACTH), and cortisol. If so, the equivalent responses to the two equally hypertonic infusions would support the possible involvement of acute sodium load administration in the mechanism of NaLAC-induced panic. ... Infusions were administered at the standard experimental rate of 10 mL/kg over 20 min (Cowley and Arana 1990). ... A panic attack occurred during at least one of the hypertonic infusion conditions in all 8 panic disorder subjects but no in healthy subject (Fisher's Exact Test $p < .001$, $df=1$). Incidence of panic in panic disorder subjects was very similar in the two hypertonic infusion conditions. Panic occurred in 6 of the 8 panic disorder subjects during NaLAC infusion, in 7 of the 8 panic disorder subjects during HS infusion, but in no panic disorder subject during the NS infusion (NaLAC vs. NS, $p = .02$; HS vs. NS, $p = .01$; McNemar Test, one tailed). Panic incidence did not differ between the two hypertonic solutions (NaLAC vs. HS, $p = 1.0$, McNemar Test, two tailed). In 5 panic disorder subjects, panic occurred in both hypertonic infusion conditions; in 2 panic disorder subjects, panic occurred only in the HS condition; and in 1 panic disorder subject, panic occurred only in the NaLAC infusion condition. In all 3 panic disorder subjects in whom panic occurred in only one of the hypertonic infusion conditions, panic always occurred during the first hypertonic infusion

administered. ... API (Acute Panic Inventory) increases during NaLAC and HS in panic disorder subjects were significantly larger than those observed in healthy subjects in the same infusion conditions. ... In healthy subjects, API scores increased modestly and similarly during NaLAC and HS infusions. ... NaLAC and HS infusions produced substantial and equivalent increases in serum sodium. Serum sodium increases in these two conditions did not differ between subject groups. NS infusion had no effect on serum sodium. ... NaLAC produced a mixed metabolic and respiratory alkalosis in both panic disorder and healthy subjects, with increased venous pH and serum bicarbonate and decreased venous pCO₂. Both HS infusion and NS infusion produced a very mild metabolic acidosis with decreased venous pH in both panic disorder and healthy subjects. ... A possible component of the physiologic mechanism of panic induction by hypertonic sodium solutions is the stimulatory effect of acute hypernatremia on brain stem catecholaminergic systems. ... These results demonstrate that rapid infusion of hypertonic sodium chloride can be added to the group of stimuli capable of inducing panic in persons with panic disorder. These results also suggest that the large sodium load delivered equally by 0.5 mol/L NaLAC infusion and 3% sodium chloride infusion is a possible mechanism to explain precipitation of panic by these two stimuli. ... The current data suggest that rapid administration of a sodium load and the resultant acute hypernatremia represent a logical mechanism to explain the precipitation of panic by both NaLAC and HS. They do not suggest that acute hypernatremia is involved in spontaneous panic or panic induced by other stimuli. Rather, these data suggest that rapid administration of a large sodium load is one of a number of stimuli with a propensity to induce a panic episode in persons with panic disorder. If so, exploration of brain neuronal systems responsive to sodium perturbations may shed light on the neurobiology of panic disorder."

Despite that nothing about the Na-K pump in the article, this is a very interesting work. Who is ill and who is healthy? Why we eat the salt (or, why we like it)? Possible, this is a consequence of our devolution and is a consequence (a symptom) of Sodium-Induced Disorder Syndrome? Why do the urban mice (and free-living animals) not eat salt? The sodium-induced panic is a disorder really?

Padre (Z. Sandor)

4 September 2014 - 9:14am [#11 Zoltan Sandor](#)

Fresh example - how to make worthless pseudoscience by using meta-analysis:

42. Jian Jin, Zhiguo Ouyang & Zhaoyan Wang: Association of fruit and vegetables with the risk of nasopharyngeal cancer: Evidence from a meta-analysis

Scientific Reports 4, Article number: 5229 doi:10.1038/srep05229

Received 18 February 2014 Accepted 11 April 2014 Published 10 July 2014

<http://www.nature.com/srep/2014/140610/srep05229/full/srep05229.html>

From the abstract:

"Our analysis indicated that intake of vegetables and fruit may have a protective effect on NPC. Since the potential biases and confounders could not be ruled out completely in this meta-analysis, further studies are needed."

From the article:

"For vegetable intake and NPC, data from 10 articles^{15, 18, 20, 23, 24, 25, 26, 27, 28, 29} with 11 case-control studies were used including 3749 NPC cases and 4452 controls. Inverse association of vegetable intake with risk of NPC was reported in 4 studies, and no significant association of vegetable intake with risk of NPC was reported in 7 studies."

"Four studies reported that fruit intake can reduce the NPC risk, while 6 studies didn't showed the significant association between fruit intake and NPC risk."

"Three studies^{16, 18, 20} were conducted to assess the association between total vegetables and fruit and NPC risk, and the summary RR for the highest versus the lowest intake was 0.33 (95% CI = 0.25–0.45, I² = 0.0%, P_{heterogeneity} = 0.56) for fruits and vegetables combined."

Mainly because less salt in it. But nothing about salt and sodium in the article. Despite that in the references:

2. Yu, M. C., Ho, J. H., Ross, R. K. & Henderson, B. E. Nasopharyngeal carcinoma in Chinese - salted fish or inhaled smoke? *Prev Med* 10, 15–24 (1981). **(43.)**

<http://www.ncbi.nlm.nih.gov/pubmed/7232343>

[http://dx.doi.org/10.1016/0091-7435\(81\)90002-5](http://dx.doi.org/10.1016/0091-7435(81)90002-5)

“The role of two proposed risk factors for nasopharyngeal carcinoma (NPC) in Chinese was examined by comparing incidence rates (1974–1975) of NPC among Chinese in Hong Kong with those in Los Angeles County (1972–1976) by age, sex, birthplace, and occupation. In Hong Kong, incidence rates for NPC were highest for persons born outside of the Chiu Chau region in Kwangtung Province. In Los Angeles County, the highest rates were observed for immigrant Chinese followed by indigenous Chinese. The high rates in Hong Kong-born Chinese and in Hong Kong boat people and the much higher rates in men compared with women do not support an inhaled carcinogen as the major risk factor for NPC in southern Chinese. The incidence data coupled with available experimental evidence are most consistent with consumption of Cantonese salted fish as the major etiologic factor.”

21. Jia, W. H. et al. Traditional Cantonese diet and nasopharyngeal carcinoma risk: a large-scale case-control study in Guangdong, China. *BMC cancer* 10, 446 (2010). **(44.)**

<http://dx.doi.org/10.1186/1471-2407-10-446>

<http://www.biomedcentral.com/1471-2407/10/446>

<http://www.ncbi.nlm.nih.gov/pubmed/20727127>

“Results

Observations made include the following: 1) consumption of canton-style salted fish, preserved vegetables and preserved/cured meat were significantly associated with increased risk of NPC, with enhanced odds ratios (OR) of 2.45 (95% CI: 2.03-2.94), 3.17(95% CI: 2.68-3.77) and 2.09 (95% CI: 1.22-3.60) respectively in the highest intake frequency stratum during childhood; 2) consumption of fresh fruit was associated with reduced risk with a dose-dependent relationship ($p = 0.001$); and 3) consumption of Canton-style herbal tea and herbal slow-cooked soup was associated with decreased risk, with ORs of 0.84 (95% CI: 0.68-1.03) and 0.58 (95% CI: 0.47-0.72) respectively in the highest intake frequency stratum. In multivariate analyses, these associations remained significant.

Conclusions

It can be inferred that previously established dietary risk factors in the Cantonese population are still stable and have contributed to the incidence of NPC.”

26. Armstrong, R. W. et al. Nasopharyngeal carcinoma in Malaysian Chinese: salted fish and other dietary exposures. *International journal of cancer. Int J Cancer* 77, 228–235 (1998). **(45.)**

<http://www.ncbi.nlm.nih.gov/pubmed/9650558>

“We interviewed 282 histologically confirmed cases of nasopharyngeal carcinoma (NPC) in Chinese residents of Selangor and the Federal Territory, Malaysia, and an equal number of Chinese age-, sex-, and length-of-residence-matched controls sampled from the general population. Consumption of 55 dietary items during childhood, and 5 years pre-diagnosis of NPC, was analyzed by univariate and multivariate methods. Four salted preserved foods (fish, leafy vegetables, egg and root), fresh pork/beef organ meats and beer and liquor consumption exhibited strong positive associations, and 4 vegetable/fruit combinations strong negative associations with NPC. Factor analysis and multivariable modeling using estimated factor scores strongly supported separate effects on NPC of vegetables/fruits, salted preserved foods, pork/beef organ meats and beer/liquor consumption. Multivariable modeling associated NPC most clearly with high consumption of salted fish, salted eggs, pork/beef liver and beer and low consumption of Chinese flowering cabbage, oranges/tangerines and shrimp. A strong residual association of social class with NPC remained after adjustment for diet, which is consistent with a substantial role for non-dietary environmental factors.”

28. Ning, J. P., Yu, M. C., Wang, Q. S. & Henderson, B. E. Consumption of salted fish and other risk factors for nasopharyngeal carcinoma (NPC) in Tianjin, a low-risk region for NPC in the People’s Republic of China. *J Natl Cancer Inst* 82, 291–296 (1990). **(46.)**

<http://www.ncbi.nlm.nih.gov/pubmed/2299678>

<http://dx.doi.org/10.1093/jnci/82.4.291>

"The dietary habits, occupational exposures, use of tobacco and alcohol, and medical history were compared among 100 patients with histologically confirmed nasopharyngeal carcinoma (NPC) in Tianjin City, People's Republic of China, and 300 neighborhood controls who were individually matched to the patients with regard to age (within 5 yr), sex, and race (Han). Exposure to salted fish was significantly associated with an increased risk of NPC. Four characteristics of exposure to salted fish independently contributed to the increased risk: (a) earlier age at first exposure, (b) increasing duration of consumption, (c) increasing frequency of consumption, and (d) cooking the fish by steaming it rather than frying, grilling, or boiling it. In addition, significant associations were observed for consumption in childhood of salted shrimp paste (increased risk) and carrots (reduced risk), and the three dietary effects (i.e., those from consumption of salted fish, salted shrimp paste, and carrots) were independent of each other. None of the nondietary factors studied were significantly associated with NPC risk."

47. Cancer-Fighting Diet: 6 Tips to Reduce Your Risk

By Christopher Wanjek, Columnist June 30, 2014

<http://www.livescience.com/46612-cancer-fighting-diet-tips.html>

And nothing about salt and sodium intakes.

Padre (Z. Sandor)

8 December 2014 - 11:49am #12 [Zoltan Sandor](#)

48. Sung-Kyun Ko, Sung Kuk Kim, Andrew Share, Vincent M. Lynch, Jinhong Park, Wan Namkung, Wim Van Rossom, Nathalie Busschaert, Philip A. Gale, Jonathan L. Sessler & Injae Shin:

Synthetic ion transporters can induce apoptosis by facilitating chloride anion transport into cells

Nature Chemistry (2014) doi:10.1038/nchem.2021 Published online 11 August 2014

<http://www.nature.com/nchem/journal/vaop/ncurrent/full/nchem.2021.html>

Abstract:

"Anion transporters based on small molecules have received attention as therapeutic agents because of their potential to disrupt cellular ion homeostasis. However, a direct correlation between a change in cellular chloride anion concentration and cytotoxicity has not been established for synthetic ion carriers. Here we show that two pyridine diamide-strapped calix[4]pyrroles induce coupled chloride anion and sodium cation transport in both liposomal models and cells, and promote cell death by increasing intracellular chloride and sodium ion concentrations. Removing either ion from the extracellular media or blocking natural sodium channels with amiloride prevents this effect. Cell experiments show that the ion transporters induce the sodium chloride influx, which leads to an increased concentration of reactive oxygen species, release of cytochrome c from the mitochondria and apoptosis via caspase activation. However, they do not activate the caspase-independent apoptotic pathway associated with the apoptosis-inducing factor. Ion transporters, therefore, represent an attractive approach for regulating cellular processes that are normally controlled tightly by homeostasis."

And the spontaneous diffusion of excess salt intakes also leads to an increased concentration of reactive oxygen species, and our (formerly healthy) cells are dying.

http://www.science20.com/news_articles/killing_cancer_cells_with_salt-142489

Padre (Z. Sandor)

12 October 2014 - 11:52am #13 [Zoltan Sandor](#)

I wrote in main article about Na/K ratio:

"Only in the colostrum is this molar ratio close to one to one, but this has an evolutionary explanation." But I did not write the explanation down yet. It is well known that in the new-born babies the

thermoregulation system does not work (it cannot develop under constant temperature, during pregnancy). Also well known the cooling (decreasing core temperature) can be lethal for babies. But the blind watchmaker (the natural selection) "learned" well the fundamental natural laws of physics, chemistry, biochemistry and physiology, and he uses these knowledges (note - the biochemistry and the physiology were his own works). The higher sodium content in colostrum (327 mg/l during 1-5 days vs 107 mg/l during 90-180 days of breast feeding - Yamawaki et al. **14.**) and excess diffusion of Na ions switches on the anaerobic glycolysis in cells of babies automatically. This is the Sodium-Induced Cellular Anaerobic Thermogenesis presented by Osaka et al. **9.** - despite that is concealed and the article was censored. This excess "entropy-transfer" into the babies is necessary, because has evolutionary benefit by decreasing the risk of lethal cooling. But naturally, after the development of the thermoregulation is not need excess (anaerobic) thermogenesis and isn't need excess sodium. The blind watchmaker knows the optimal ratios (and quantities) of metals and other components of milk (Na/K ratio, ratio between sum of alkaline metals and sum of polyvalent metals etc.) and makes these ratios in mature milks. The wrong recipes of milks fall out continuously from the genes - the natural selection works so. Second part of the explanation. It is also known the developing foetus drinks from the amniotic fluid regularly. The taste of colostrum and the taste of the amniotic fluid are similar, because the (electrolyte) composition are similar. This is also beneficial, because the taste of colostrum isn't unusual for the new-born babies, and the sodium content decreases to the optimal level gradually. That is why mammalian milks (including colostrum for 1-5 days after birth) are evolutionary perfect foods for babies and are perfect guides to calculate optimal adult intakes - from every viewpoint (including Na, K, Ca, Mg etc).
Padre (Z. Sandor)

8 December 2014 - 11:11am #14 Zoltan Sandor

49. Dana Dabelea, Elizabeth J. Mayer-Davis, Sharon Saydah, Giuseppina Imperatore, Barbara Linder, Jasmin Divers, Ronny Bell, Angela Badaru, Jennifer W. Talton, Tessa Crume, Angela D. Liese, Anwar T. Merchant, Jean M. Lawrence, Kristi Reynolds, Lawrence Dolan, Lenna L. Liu, Richard F. Hamman: Prevalence of Type 1 and Type 2 Diabetes Among Children and Adolescents From 2001 to 2009 JAMA. 2014;311(17):1778-1786. doi:10.1001/jama.2014.3201.

<http://jama.jamanetwork.com/article.aspx?articleid=1866098>

http://www.science20.com/news_articles/type_1_and_2_diabetes_up_sharply_among_us_youth-135555

"In 2001, 4958 of 3.3 million youth were diagnosed with type 1 diabetes for a prevalence of 1.48 per 1000 (95% CI, 1.44-1.52).

In 2009, 6666 of 3.4 million youth were diagnosed with type 1 diabetes for a prevalence of 1.93 per 1000 (95% CI, 1.88-1.97).

In 2009, the highest prevalence of type 1 diabetes was 2.55 per 1000 among white youth (95% CI, 2.48-2.62) and the lowest was 0.35 per 1000 in American Indian youth (95% CI, 0.26-0.47) and type 1 diabetes increased between 2001 and 2009 in all sex, age, and race/ethnic subgroups except for those with the lowest prevalence (age 0-4 years and American Indians). Adjusted for completeness of ascertainment, there was a 21.1% (95% CI, 15.6%-27.0%) increase in type 1 diabetes over 8 years. In 2001, 588 of 1.7 million youth were diagnosed with type 2 diabetes for a prevalence of 0.34 per 1000 (95% CI, 0.31-0.37). In 2009, 819 of 1.8 million were diagnosed with type 2 diabetes for a prevalence of 0.46 per 1000 (95% CI, 0.43-0.49)."

Well, if the growing rate of prevalence remains constant we can predict.

Type 1 diabetes:

in 2001: 1,48 / 1000

in 2009: 1,93 / 1000

In ~ 2200: every youth in US (similar hungarian prediction, in ~ 2250: every children).

Type 2 diabetes:

in 2001: 0,34 / 1000

in 2009: 0,46 / 1000

In ~ 2215: every youth in US.

50. Rising Mental Health Issues Facing Our Children, in Five Charts

<http://www.theatlantic.com/sponsored/athena-where-does-it-hurt/>

Percent increase from 2010 to 2013: anxiety + 72 %, autism + 52 %, depression + 47 %, eating disorder + 29 %.

But - without natural selection - our devolution accelerates spontaneously, because we have technical civilisation and we have medical sciences (and we have pseudosciences). This is a logical consequence of the rules of the inheritance. Really, the growing entropy is our number one public enemy on every level of our existence.

51. Emil Jeyaratnam, Jo Adetunji: Infographic: how UK health spending compares to other countries

<https://theconversation.com/infographic-how-uk-health-spending-compares-to-other-countries-31184>

From this - Health expenditure as a share of GDP

USA 16.9 %

Netherlands 11.8 %

Canada 10.9 %

New Zealand 10.0 %

Sweden 9.6 %

UK and Norway 9.3 %

Australia 9.1 %

OECD average 9.3 %

How many percent will be the health cost for example in 2040?

Padre (Z. Sandor)

11 December 2014 - 11:46am #15 [Zoltan Sandor](#)

All the nutrition science is a lot of pseudoscience.

52. Frank W. Marlowe: The Hadza Hunter-Gatherers of Tanzania

UNIVERSITY OF CALIFORNIA PRESS Berkeley, Los Angeles, London 2010

<http://www.ucpress.edu/book.php?isbn=9780520253421>

From the book: "A common misconception is that meat is shared because it will spoil and be worth nothing to the hunter. But the Hadza often eat very rotten week-old meat they scavenge from carnivores.

The Hadza (and many other foragers) know how to preserve meat by drying it, but they rarely do so because it gets eaten so quickly. Even very large animals usually do not last a week because word spreads (often despite efforts to keep it a secret) and people come from other camps to get some."

and:

"Woodburn (1980) described the Hadza as an immediate-return society. Delayed-return societies are those where considerable effort is expended in preparation for harvesting foods in the fairly distant future. This includes all agriculturalists but some foragers as well. For example, foragers in the Pacific Northwest of North America constructed labor-intensive weirs and dams across rivers and built large permanent smoke houses for drying the fish they caught. Some of these fish would be eaten months later, long after the fish runs were over. This sort of planning for the distant future is something the Hadza do not do. They do not need to because foods are available year-round. Most foods vary between the rainy and the dry seasons, but one kind of food or another can be acquired and eaten the same day, day in and day out, year-round. There is simply no need to store food."

and only this about salt:

"To the west of Lake Eyasi, the Hadza interact with the Sukuma; the Iramba, who are Bantu; the Masai, who are Nilotic; and now the Taturu, a branch of the Datoga who have been moving into the area in large numbers. The Sukuma have for some time been driving their cattle through Hadzaland on their way to market in Arusha. Long ago, they also made trips in caravans to obtain salt from Lake Eyasi (Senior 1957)."

We are omnivorous, and the real peleo diet = healthy food = no salt! But the nutrition scientists and health scientists ignore this fact.

53. Remko S. Kuipers, Josephine C. A. Joordens and Frits A. J. Muskiet: A multidisciplinary reconstruction of Palaeolithic nutrition that holds promise for the prevention and treatment of diseases of civilisation

Nutrition Research Reviews (2012) 25, 96–129 doi:10.1017/S0954422412000017

<http://dx.doi.org/10.1017/S0954422412000017>

From the article: "Deficiencies of the above 'brain-selective nutrients' are among the most widely encountered in the current world population (101,334). While iodide is added to table salt in many countries, margarines and milk have become popular food products for fortification with vitamins A and D."

This is a review article, more than 30 pages, with 450 references! And only this about the salt. The real science of salt is a taboo! It is censored! Is this true science? Not, this is lack of real science = pseudoscience, and this is a goldmine for nutrition charlatans - both amateur and professional (univ. educated) "doctors".

Why the medical doctors and nutritionists cannot understand that the diffused amount of sodium (into the cells) is proportional with the surface? And the surface (billions) of our cells is extreme large. Consequently, little increase in extracellular Na concentration induces significant excess work for Na-K pumps = significant excess energy expenditure against entropy. But our capacity is limited! Our ancestors and for example Hadza hunter-gatherers do not eat salt. And we cannot adopt the salted foods!

Some more evidences of the sad reality:

<https://theconversation.com/hard-evidence-what-do-primary-school-children-need-to-eat-31868>

&:

<https://theconversation.com/salt-overload-its-time-to-get-tough-on-the-food-industry-32113>

including comments.

And my e-mail correspondence with Niels Graudal <http://padre.uw.hu/ekvis/graudal.htm>

Padre (Z. Sandor)

10 December 2014 - 10:24am [#16 Zoltan Sandor](#)

The "science" of salt, nutrition and health.

Hear no truth, see no truth, speak no truth!



Padre (Z. Sandor)

11 December 2014 - 11:43am #17 Zoltan Sandor

"Only two things are infinite, the universe and human stupidity and I'm not sure about the former." Albert Einstein

"And the third is the human irresponsibility. I'm not sure about the first also. But, unfortunately all three expand." Zoltan Sandor

It's time to understand (and to teach and to use) some very important but forgotten, ignored and censored knowledges (some fundamental natural laws and facts) and the very sad consequences:

"Anything that can go wrong not only will go wrong, it must go wrong, as decreed by the Second Law of Thermodynamics. ... The profound nature of the Second Law manifests itself in every aspect of human existence. ... Entropy permeates all aspects of human existence. ... Every biochemical function requires a decrease in entropy, which can only be achieved by the infusion of energy into a life-sustaining system. ... Wherever we look, whatever we do, we must be acutely aware of the immutable laws of thermodynamics, especially the easily overlooked Second Law: Entropy." Source: **54**.

<http://www.rationality.net/entropy.htm>

- The spontaneous diffusion of sodium ions into the cells and the diffusion of potassium ions out of the cells, continuously enhances the entropy (the disorder).
- The task of the continuously working sodium-potassium pump to keep constant the intracellular concentration of Na and K ions. These cellular pumps continuously use energy of ATP molecules.
- Excess sodium intake = excess diffusion = excess increase of entropy = excess work for pumps = excess energy expenditure against excess entropy => excess food consumption.
- But, all the rest of our vital processes (functional processes of the cells) receive less energy - because our capacity (to make energy from foods) is limited (see Kleiber's Law <http://arxiv.org/pdf/1407.3659v1> **55**).
- Everything work worse in our body, and this increases the incidence of all illnesses without any exception, our aging and devolution accelerate, etc.
- Logical and undebatable, the sodium salts are perfect foods of entropy, and are the causes of the Sodium-Induced Disorder Syndrome.

The entropy is our number one public enemy on every level (physical and mental health, and social level) globally. The evolution of life on Earth, our evolution, our history and our entire individual life is a continuous war against entropy. But we, humans started our devolution = the entropy is growing in human genome. Even we nourish the entropy in our every cells (fundamentals of our existence), but the health scientists do not talk and do not write about this. And this is really a fatal error. The NCK = Non-Communicable Knowledge and pseudoscience are too much in the "science" of salt, nutrition and health. It's time to change that!

56. M F Jacobson: Letter to the Editor, Editorial on the politics of salt and blood pressure
Kidney International (2007) 71, 85–86. doi:10.1038/sj.ki.5001951
<http://www.nature.com/ki/journal/v71/n1/full/5001951a.html>

From this Letter: "The Center for Science in the Public Interest <http://www.cspinet.org/> in 1978 petitioned the Food and Drug Administration to revoke the generally recognized as safe status and limit salt, especially in the biggest sources of sodium. (The US Department of Agriculture should do the same for meat and poultry products.) After the Food and Drug Administration failed to take action, Center for Science in the Public Interest sued the Food and Drug Administration (unsuccessfully) in 1982 and 2005, and later in 2005 again petitioned the agency to protect the public health. Halving sodium levels in packaged and restaurant foods could save 150 000 lives per year.³ It is unfortunate that government health authorities have not shown the will to act."

But the CSPI is weak, because they don't use the already existing (forgotten, ignored and censored) knowledges. This is an astonishingly guilty irresponsibility and/or astonishing ignorance. Now I am "persona non grata" on some Facebook sites, e.g. <http://www.facebook.com/cspinet> - this is not success for me, but more than nothing, they read my comments at least.

These are also not successes, but evidences of the sad reality (mainly astonishingly wrong education).

57.

<http://theconversation.com/hard-evidence-what-do-primary-school-children-need-to-eat-31868>

Melanie Wakeman (Senior Lecturer in Nutrition and Applied Physiology at Birmingham City University) wrote: "To be honest Zoltan I can't see how milk can indicate what our salt intake should be? ..."

and **58.**

<http://www.sciencebasedmedicine.org/what-whole-foods-markets-doesnt-tell-you/#comment-218376>

"Wow, that is a LOT of crazy."

But I have some "success" e.g. in this response:

<http://www.sciencebasedmedicine.org/what-whole-foods-markets-doesnt-tell-you/#comment-216959>

"How awesome to be the only one with the truth."

If I will be lonely for a long time, a very sad fate waits for these babies and for the humanity.



Padre (Z. Sandor)

8 March 2014 - 4:01pm #18 Zoltan Sandor

Some important knowledge of sodium-potassium pump.

59. A. J. Hulbert, Paul Lewis Else: Membranes as Possible Pacemakers of Metabolism

Journal of Theoretical Biology Volume 199, Issue 3, 7 August 1999, Pages 257–274

<http://dx.doi.org/10.1006/jtbi.1999.0955>

<http://www.sciencedirect.com/science/article/pii/S0022519399909554>

From the article: "Our own studies on endotherms and ectotherms have shown that the increased sodium pump activity of mammals is also not associated with an increase in sodium pump number.

Measurement of sodium pump concentration has shown consistent values that vary between tissues (in pmol g⁻¹ tissue; 250 for skeletal muscle, 500 for liver, 900 for heart and 8000 for brain and kidney), but not between similar-sized species of vertebrate. However, there are large differences in tissue Na⁺K⁺-ATPase activities between endothermic and ectothermic vertebrate species which indicates that the extra work performed by mammalian sodium pumps is derived from an increase in turnover rate, or molecular activity, of individual sodium pumps. Irrespective of tissue source (heart, brain, liver, kidney and skeletal muscle) **the molecular activity of sodium pumps in mammals is approximately 8000 ATPmin⁻¹** and in ectotherms 2500 ATPmin⁻¹ at 37°C (Else et al., 1996)."

60. Ben J. Wu, Paul L. Else, Leonard H. Storlien, and A. J. Hulbert: Molecular activity of Na⁺/K⁺-ATPase from different sources is related to the packing of membrane lipids

The Journal of Experimental Biology 204, 4271–4280 (2001)

<http://jeb.biologists.org/content/204/24/4271.full>

From the article: "**The maintenance of the trans-plasmalemmal Na⁺ gradient is a significant component of the cost of living in animals**, as is the maintenance of other transmembrane gradients (Rolfe and Brown, 1997; Brand et al., 1994). ... **The idea that physical effects are likely to be a general phenomenon operating on membrane proteins (as well as chemical effects) opens up new ways of understanding and approaching some modern medical problems. For example, many prevalent disease conditions in western societies (e.g. obesity, hypertension, blood dyslipidaemias, type II diabetes, atherosclerosis) are associated and represent a 'metabolic syndrome' centred around tissue insulin-resistance** (Reaven, 1993). Insulin-resistance has been shown to be related to a relative deficiency of polyunsaturated fatty acids in both rat (Storlien et al., 1991) and human (Borkman et al., 1993; Vessby et al., 1994) tissue. When rats are fed a diet high in saturated fat but deficient in dietary-essential *n*-3 polyunsaturates, they first develop insulin-resistance, followed by hyperinsulinaemia, hypertension and obesity (Barnard et al., 1998). Changes in membrane acyl composition, achieved by dietary and possibly pharmacological means, may thus offer a potential therapy to improve insulin action. Similarly, changes in the acyl composition of phospholipids, now being considered as a potential biochemical basis for the development of schizophrenia (Horrobin, 1998), supported by *post-mortem* brain analysis (Yao et al., 2000), suggest that consideration should be given to the physical as well as the chemical effects of changes in membrane bilayer composition. The insights generated by this study are largely due to expressing enzyme activity in units of molecular activity; i.e. expressing enzyme activity relative to the number of individual enzyme molecules present. This approach has distinct advantages in that it allows comparison both amongst tissues within a single species and amongst species. Such comparisons, by using the natural laboratory of evolution, can provide considerable understanding and insight into how living systems operate. We believe this approach will also be beneficial when applied to other enzymes."

But, without real science of salt - where is the considerable understanding?

61. Nigel Turner, Paul L. Else, A. J. Hulbert: Docosahexaenoic acid (DHA) content of membranes determines molecular activity of the sodium pump: Implications for disease states and metabolism.

Naturwissenschaften **2003**, 90, 521–523. - See more at:

<http://www.mdpi.com/2072-6643/3/5/529/htm#B52-nutrients-03-00529>

<http://link.springer.com/article/10.1007%2Fs00114-003-0470-z>

"Abstract The omega-3 polyunsaturate, docosahexaenoic acid (DHA), plays a number of biologically important roles, particularly in the nervous system, where it is found in very high concentrations in cell membranes. In infants DHA is required for the growth and functional development of the brain, with a deficiency resulting in a variety of learning and cognitive disorders. During adulthood DHA maintains normal brain function and recent evidence suggests that reduced DHA intake in adults is linked with a number of neurological disorders including schizophrenia and depression. Here we report a high positive correlation between the molecular activity (ATP min^{-1}) of individual $\text{Na}^+\text{K}^+\text{ATPase}$ units and the content of DHA in the surrounding membrane bilayer. **This represents a fundamental relationship underlying metabolic activity, but may also represent a link between reduced levels of DHA and neurological dysfunction, as up to 60% of energy consumption in the brain is linked to the $\text{Na}^+\text{K}^+\text{ATPase}$ enzyme.**"

From Results: "Substantial diversity in membrane lipid composition was observed both between tissues and species. DHA content in particular showed the greatest variation of any fatty acid, with an approximately 80-fold difference observed. Linear correlation coefficients were determined between individual lipid parameters and **$\text{Na}^+\text{K}^+\text{ATPase}$ molecular activity (range 1,620-29,000 ATP min^{-1})**. High concentrations of DHA (22:6n-3) were associated with high $\text{Na}^+\text{K}^+\text{ATPase}$ molecular activity (Fig. 1)."

From the end of the article: "While the precise mechanism by which DHA acts to increase the activity of membrane proteins such as $\text{Na}^+\text{K}^+\text{ATPase}$ is not fully understood, the physical properties of this fatty acid are increasingly being recognised as an important factor. DHA is consistently associated with high rates of ion transport and metabolism in animals, and dietary intake of this fatty acid alleviates the symptoms of several health conditions that result from perturbations in membrane function. This important constituent of biological membranes may be therefore regulating metabolic activity and health in general, via its interactions with membrane proteins."

62. Joanne Bradbury: Review Docosahexaenoic Acid (DHA): An Ancient Nutrient for the Modern Human Brain. *Nutrients* **2011**, 3, 529-554; doi:10.3390/nu3050529

<http://www.mdpi.com/2072-6643/3/5/529/htm>

From the article: "These recent advances in understanding the influence of the highly unsaturated DHA molecule in the membrane phospholipids has fuelled speculation that it may work as a metabolic "pacemaker" for cells, and perhaps influence the metabolism of the whole organism via an impact on the basal metabolic rate [51]. This theory was tested by Turner et al. [52], who demonstrated a positive linear relationship between the high molecular activity of the enzyme $\text{Na}^+\text{K}^+\text{ATPase}$ (the sodium-potassium pump) and membrane concentration of DHA in the surrounding phospholipids in brain, heart, and kidney tissue of samples from both mammals and birds. Further, the highest concentration of DHA was found in the mammalian brain as was the highest activity rate of the pump. This is significant as the sodium-potassium pump accounts for some 20% of the basal metabolic rate but approximately 60% of the energy utilization in the brain.

Brenna and Diao [53] found that cerebral DHA levels are highest in high energy tissue. They demonstrated a direct linear relationship ($r^2 = 0.68$, $p = 0.003$) between DHA levels in brain tissue and local cerebral metabolic rate of glucose uptake into cells. As levels of cellular metabolism increase, so does its byproduct, oxidative stress. Brenna and Diao suggest these observations are consistent with a critical structural role for DHA in the cell membrane and perhaps also a metabolic role for DHA in the regulation of oxidative stress. Together, these findings may provide a biochemical basis for a beneficial role for DHA in the metabolic syndrome and also neurodegenerative disease processes."

But in these articles nothing about the effect of high sodium intakes! It's a taboo!

63. Feng J. He, PhD; Graham A. MacGregor, MD: Reducing Population Salt Intake - Time for Global Action

The Journal of Clinical Hypertension Volume 17, Issue 1, pages 10–13, January 2015

DOI: 10.1111/jch.12404

<http://onlinelibrary.wiley.com/doi/10.1111/jch.12404/abstract>

<http://onlinelibrary.wiley.com/doi/10.1111/jch.12404/full>

But nothing about Na/K pump - so, lack of real science = pseudoscience.

"Men are born ignorant, not stupid. They are made stupid by education."

Bertrand Russell

"But in the near future, men will be born stupid. Men are born humans, but they are converted into experimental animals by health sciences, and in the near future, men will be born animals."

Zoltan Sandor

Yes, time for global action - with real science of salt!

Padre (Z. Sandor)

Combo of overweight, high sodium intake speeds cell aging in teens



SAN FRANCISCO — Overweight or obese teenagers who eat lots of salty foods may show signs of faster cell aging.

“Lowering sodium intake, especially if you are overweight or obese, may slow down the cellular aging process that plays an important role in the development of heart disease,” said Haidong Zhu, M.D., Ph.D., lead author of the study presented Thursday and assistant professor of pediatrics at Medical College of Georgia, Georgia Regents University in Augusta, Ga.

Previous research found that protective ends on chromosomes (telomeres) naturally shorten with age, but the process is accelerated by smoking, lack of physical activity and high body fat. The current study is the first to examine the impact of sodium intake on telomere length.

In the study, 766 people 14-18 years old were divided into the lowest or highest half of reported sodium intake. Low-intake teens consumed an average 2,388 mg/day, compared with 4,142 mg/day in the high-intake group. Both groups consumed far more than the 1,500 mg/day maximum (about 2/3 teaspoon of salt) recommended by the American Heart Association.

After adjusting for several factors that influence telomere length, researchers found:

- In overweight/obese teens, telomeres were significantly shorter with high-sodium intake (T/S ratio of 1.24 vs. 1.32). T/S ratios are the ratio of the length of the telomere to the length of a single gene.
- In normal weight teens, telomeres were not significantly different with high-sodium intake (T/S ratio of 1.29 vs. 1.30).

“Even in these relatively healthy young people, we can already see the effect of high sodium intake, suggesting that high sodium intake and obesity may act synergistically to accelerate cellular aging,” Zhu said.

Obesity is associated with high levels of inflammation — which also hastens telomere shortening — and increases sensitivity to salt, which may help explain why higher sodium intake had a greater effect in that group.

“Lowering sodium intake may be an easier first step than losing weight for overweight young people who want to lower their risk of heart disease,” Zhu said. “The majority of sodium in the diet comes from processed foods, so parents can help by cooking fresh meals more often and by offering fresh fruit rather than potato chips for a snack.”

The research presented at the American Heart Association's Epidemiology & Prevention/Nutrition, Physical Activity & Metabolism Scientific Sessions 2014. The National Heart, Lung, and Blood Institute funded the study.

<http://blog.heart.org/combo-of-overweight-high-sodium-intake-speeds-cell-aging-in-teens/>

For more information:

- News release

March 20th, 2014|Blog|1 Comment

One Comment

1.

Zoltán Sándor March 20, 2014 at 6:01 pm - Reply

From my article: Entropy and sodium intakes, the wicked problems of health sciences:

"... Some consequences of high sodium intake; the specialists talk about these rarely or never: Higher energy requirements (energy expenditure) for Na-K pump and kidney. All the rest of our vital processes (functional processes of the cells) receive less energy – because the metabolic rate (speed and capacity of enzyme reactions, oxygen supply, etc.) is limited. And the excess sodium intake do not increase the oxidative pathway. But, a critical surplus switches the anaerobic glycolysis on, in our every cells. This can be named: Sodium-Induced Cellular Anaerobic Glycolysis (SICAG). I think (it is logical) this is a very old anaerobic cellular mechanism, before free oxygen on Earth. We produce lactic acid in our every cells. Consequently, all of our vital processes and organs work worse (our heart, brain, regulating systems, immune system, etc.), and our cells are dying. Remains less energy for the regeneration. We burn the candle on both of his ends (aerobic and anaerobic). The average lifetime of our cells shortens. Soon (faster) the telomeres run out. Our aging accelerates. We get sick often and we will die soon. Logical consequence; the unnecessary sodium increases the incidence of all illnesses. Searching in 12 book set of Dietary Reference Intakes (more than 5000 pages, and about 600 references in the chapter; Sodium and Chloride) no hits for entropy, and the sodium-potassium pump is only some empty phrases. (2) The blind watchmaker learned well the physics first, then the chemistry, and dealt with biochemistry then only. But he never forgot what he learned already once. The optimal Na/K ratio and the ratio between sum of alkaline metals and sum of polyvalent metals, and the ratio between alkaline metals and energy content, etc. is in the human milk. From every viewpoint, the human milk is an evolutionary perfect food, including the minimal energy expenditure of the Na-K pump and kidney of the babies (= possible minimum entropy-transfer into the babies = the baby is growing healthily and with maximal economicalness). Thus, the human milk is the perfect guide to calculate the optimal adult intakes. Unfortunate, that these exist only in traces, in the scientific literature. And in some articles, even the traces are concealed. This is the real wicked problem of health sciences, and this is wronger than malignant neglect. I collected the most important evidences (the traces, and lack of the traces) of the above ones. Let us see it in a logical and nearly chronological order. ..."

http://www.science20.com/entropy_and_sodium_intakes_wicked_problems_health_sciences-120016