

# Rubidium, Salami and Depression

You Cannot Have Everything in Life

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## Key Words

Malnutrition, quality of life · Depression · Rubidium · Dialysis

## Abstract

**Background:** Depression may induce malnutrition, but, as a paradoxical hypothesis, malnutrition may induce depression. This relationship, of course, depends on how we define malnutrition. **Current Knowledge:** Rubidium is a trace element strongly linked with depression, and is deficient in uremia sufferers. However, in uremic patients, rubidium deficiency is more evident during predialysis, as it is at least partially corrected during dialysis and after transplantation. It seems that diet restrictions might be the main cause of rubidium deficiency, as it is mainly found in red meat. **Conclusion:** If rubidium is found in salami, then the occasional slice could be more beneficial for people suffering from depression than taking a lot of medication.

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## Background

Depression is considered to be a typical neurobehavioral change in uremic patients [1–5], and nutritional intake has recently been linked to depression. Sufferers of

depression tend to have bad diets [6]. However, we would like to turn this hypothesis on its head, and propose that whoever eats badly increases their likelihood of being depressed. Of course, in order to test these hypotheses, there needs to be a clear definition of what eating badly actually means. Unfortunately, at the moment, there is no common standard.

The trace element rubidium has several antidepressant properties. It belongs to the group of lithium, sodium, potassium and calcium, and it is exchangeable with potassium. It has rapid oral absorption, and slowly enters into the central nervous system (red blood cell:plasma ratio = 3:20). The total content in the human body is 400–900 mg, with a weekly balance of 15–25 mg absorption and 20 mg excretion, and its half-life is 30–60 days [7].

This is a rough outline of the history of rubidium as an antidepressant [8–17]:

- In 1891, the cardiologist Bottkin occasionally observed that cardiac patients treated with RbCl experienced increased well-being compared to patients treated with KCl;
- In 1969, Dr. Meltzer discovered that the effects of rubidium in primates were the opposite of those produced by lithium;
- In 1976, the physiologist Mannistò observed that rubidium affects behavior in both animals and humans, as do amphetamines;

- In 1984, the discovery was made that rubidium potentiates noradrenergic and dopaminergic transmission in the central nervous system by increasing the concentration of synaptic neurotransmitters;
- In 1994, rubidium-based drugs are used to treat serious depression with an efficacy as high as that obtained by tricyclic agents, but with fewer side effects. This was subsequently abandoned because of the appearance of new antidepressant drugs.

### Rubidium and Uremia

The discussion concerning the role of rubidium as an antidepressant has recently been reopened because a deficiency has been discovered in uremic patients undergoing dialysis treatment [18–30]. Research is being carried out to discover if this deficiency is due to dialysis or a low rubidium intake in the diet. Results of initial studies suggest that the second case is more likely because the deficiency already begins in the predialysis phase [20, 22] when a low-protein diet is followed, and because the extent of the deficiency is inversely correlated to the duration of the dialysis, suggesting that beginning treatment leads to at least a partial correction of the defect [31–33]. What happens to the patients' diets when they begin treatment? They give up the low-protein diet and begin eating normally again, which means returning to a normal-protein diet, or even one including a high-protein intake.

Rubidium is mainly found in red meats [33, 34]. So, unsurprisingly, when we first compared the serum levels of rubidium in our dialysis patients with their eating habits, we noticed that those who ate salami, bresaola, sausages and cured meats on a fairly regularly basis had a higher level of rubidium [33]. This led us to conclude that if rubidium is mainly contained in red meats, and salami is made from red meat, then it must contain a high concentration of rubidium.

It was, of course, very amusing to think that we should advise our depressed patients with low rubidium levels to eat more salami. The obvious question that arises is: 'What about the lipids, cholesterol and triglycerides?' Quite simply, we had to smile and conclude that 'life is hard! You just can't have everything.' If you eat salami, your rubidium level increases and you no longer feel depressed, but you increase the risk of arteriosclerosis and the chances of dying early; if on the other hand you do not eat salami, you protect yourself from arteriosclerosis, but you could end up feeling more depressed or even sui-

cidal! Of course, it would be very nice to have scientific evidence to confirm that salami is full of rubidium, providing a medically sound reason to eat it.

### The Brain's 2 Hemispheres

The aims of the World Health Organization for the year 2000 were to add years to life and add life to the years. Every human being wants to live well, and for a long time.

Thanks to scientific discoveries, technological revolutions and the widespread availability of information, we have learned the importance of a healthy diet. Our cultural education has taught us to pick and choose those products which are good for us from the vast range available: those which contain vitamins, mineral salts and antioxidants, while avoiding foods which contain too many sugars or fats, especially the dangerous fats from animal meat that coat the walls of our blood vessels.

However, people have 2 cerebral hemispheres: the left side, which is inclined towards reasoning and the processing of structured and deductive projects, and the right side, which is more inclined towards artistic and emotive concerns, and responsible for those creative signals and impulses linked to pleasure and a sense of freedom. These 2 hemispheres are connected by bridges of organic tissue that allow for the continuous exchange of messages between the 2 parts, except in cases of severe pathological injury.

So, it naturally follows that when we are faced with appealing foods such as salami, chocolate, wine or pasta covered with a thick Bolognese sauce, we are overjoyed by the idea of eating or drinking all those things. Despite this, the left hemisphere does not give in, even though sorely tempted! It knows full well that to do so would jeopardize its dream of immortality and eternal youth. However, it can often find a way to justify erring from the strict rules that may make us eternally youthful, albeit joyless, unhappy and depressed.

Therefore, we find such wonderful and essential substances in normally forbidden foods, helping us to justify making an exception to the rule (even if these foods become more than just infrequent treats), e.g. chocolate contains endorphins [35–37], wine contains polyphenols [38–40] and, of course, salami contains rubidium. So, what exactly does this mean? Well, endorphins make you dream, polyphenols enlarge your coronary arteries and veins, and rubidium alleviates depression and puts a smile on your face [41]. What more could you ask for? Not

even the more logical part of the brain and the outermost layer of the cortex can ignore this evidence.

The contributions that these potentially lethal foods (lethal because they contain lipids, alcohol and sugars) offer the body are fundamental for our quality of life, so they must be allowed in small doses every now and again. It is clearly not only better, but also more enjoyable, to occasionally have chocolate, salami and wine than to use medication to help overcome sleeping problems and mood disorders.

## Concluding Remarks

Ever since the time of Adam and Eve, people have continuously looked for and found ways of using their brains to develop, and to justify the choices they make. Our highly developed cerebral cortex distinguishes us from our ancestors, and allows us to lead more fulfilling lives based on intelligent decisions. It enables us to see when 'we can break the rules' and enjoy ourselves. So, we should put this to use by discovering some of the beneficial properties in these 'forbidden foods', and a good place to start is measuring the rubidium content in salami!

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