Jens-Otto Andersen
Biodynamic Food Quality
Contribution for the Dynamic Nutrition Network, March 6, 2025

A preliminary remark: When working with biodynamic food quality, we should be able to bridge the span from single compounds to the individuality.

I would like to highlight three concepts from Rudolf Steiner's Agriculture Course:

- the agricultural individuality, which is mentioned early in the Agriculture Course
- the concept of fruit formation
- and finally the protein, which is understood as the real body of the plant.

When we work with the concept of **agricultural individuality** (the macroscopic approach), it is very helpful to think of what Rudolf Steiner and Ita Wegman wrote in 1925 about medical science in their book, *Fundamentals of Therapy* (*Grundlegendes für eine Erweiterung der Heilkunst*). There we learn that health could be defined as our four bodies working harmoniously, both individually and collectively. In my approach to food quality, we can take this thought from the human individuality and apply it to the agricultural individuality. Wouldn't that mean that excellent quality of health for a human being would come from agriculture, from farms that are organized like the human individuality in their matter and forces, including the cosmic forces? I call this the **macroscopic approach** to food quality.

So, the first question is whether the farmer, who is on the farm on a daily basis, is able to sense in which way this agricultural individuality is arising out of their work. My answer is that an experienced farmer has a tacit knowledge that is difficult to put into words. This tacit knowledge is based on the intimate connection that the experienced farmer has to the landscape, the biotopes, the crop rotation, and the mixed animal herd. I believe that an experienced farmer experiences the agricultural individuality as it is growing—the balances and the imbalances.

The second concept that I would like to highlight is **fruit formation**. This is not a direct quote from the Agriculture Course, but I will try to bring it together. Rudolf Steiner says that the task of spiritual science for agriculture is to offer the means to enliven the soil so that the plant is not growing in dead soil and finding it difficult to reach fruit formation out of its own vitality. What we should understand here is that the biodynamic preparations enliven the soil. That means that the soil as we generally find it on farms, including organic and biodynamic farms, is

far from being optimally alive. In order to grow truly valuable, healthy foods, we need to start by enlivening the soil, and when we do, crops—fruits, and vegetables—will come out of that which can reach fruit formation. For me, this has always been the key concept in the quality question.

Third, I would like to cast some light on words from Rudolf Steiner indicating that proteins are the real body of the plant. I call this the **microscopic approach**. It means that we cannot immediately see it, like we cannot see the farm individuality. We are on the microscopic level, so to speak. What I understand Rudolf Steiner to be saying is that when the etheric body of a living organism works to keep our organism and the plant organism alive, this happens through proteins, or more specifically, we might say through enzymes. Enzymes were not really common knowledge in 1924, but we could say that the activity of the etheric body is taking place through what biochemists call enzymes. Simply put, the etheric body is the enzyme body. In this way we bridge biochemistry and spiritual science. Rudolf Steiner did speak about digestive enzymes, and in his book written with Ita Wegman, they emphasized that proteins/enzymes either serve the etheric body, or they fall out: they are mineralized.

The Agriculture Course puts an emphasis on sulfur, and the activity of sulfur makes it possible for the etheric body to work. If we wish to follow the activity of a living organism—the enzymes and the etheric body—we should 'follow the sulphur'. The plant grows, Rudolf Steiner says, more or less following the activity of sulfur. This corresponds, in my understanding, to what in biochemistry are called sulfur bridges in protein and enzymes. This is what makes proteins and enzymes able to work. Without the sulfur bridges, the enzymes cannot work.

I haven't met anyone doing biodynamic research who is actually taking up this indication from Rudolf Steiner. Nobody has developed a method whereby we could follow sulfur in an illustrative way. I think it would be extremely valuable if someone were to introduce methods to follow this activity, because when the sulfur activity stops or is reduced, proteins or enzymes fall out of the etheric body.

How to evaluate food quality?
- three approaches

Counting compounds
Essential amino acids, fatty acids, sulphur activity
Secondary compounds

Challenging the vitality of the food
Biocrystallisation
Vitality tests

Sensing the spiritual forces and their activity in our 'bodies'
Clairvoyance
Empathic Food Testing

We should be able to work all the way from the single compounds to the level of the individuality. We know about essential amino acids, fatty acids, and secondary compounds. The next step for bridging the simple compounds and the etheric body is, in my understanding, when we can illustrate what I call the vitality in the foods. Personally, I've worked very much with biocrystallization and, in the past year, other vitality tests.

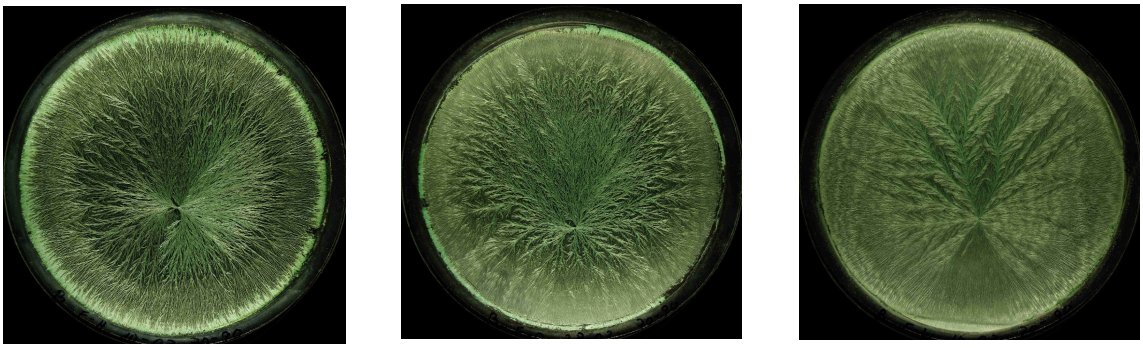
The final level, which fortunately is beginning to be active in the biodynamic movement and research, is that we are able to benefit from certain people's clairvoyant abilities. Furthermore, over the last years, this wonderful method, Empathic Food Testing, was introduced. There we go from the compounds outside us to our senses so that we can experience directly in our own body what we could call the activity of the etheric forces in our body. This is a very big step in biodynamic research.

If we follow natural science, especially medical science, we quickly notice that there is a strong movement in academic medicine to find a new definition of health, because the old one, the World Health Organization definition, is not really usable. It’s well intended, but it's not practical. Over the last decade, the concept of resilience has come into focus. I will be bold and say that within ten years, we will have a new World Health Organization definition that includes the concept of resilience. This is very important, because we have, for the first time, a very practical way of bridging between a World Health Organization concept of health and a concept that is, in my words, central in biodynamic research: vitality. This creates an enormous potential for communication.

If we want to briefly define what the vitality of the plant is, we should note that it has an inner vitality, meaning that the plant must be able to perform its life processes under pressure, because nature is often tough and the plant has to survive in great changes of temperature and conditions like too wet, too dry, too cold, too hot, and so on. This is the inner vitality of the plant, and the outer vitality is its ability to support the life processes of human beings. That's where the medical aspect of the plant comes in.

Here is a very simple illustration of the biocrystallization method. Carrots were harvested and pictures were made in June and July, and at the normal harvest in August. What you see is a 3-zonal picture on the left (June), gradually shifting towards the harvest, where we end up with a whole picture: all the crystal formations are integrated into a whole picture. The wonderful thing about this method is that it corresponds to gradual fruit formation, so we have direct research access to the fruit formation process.

Fruit formation reflected in crystals
- ripeness and vitality



June **July** **August**

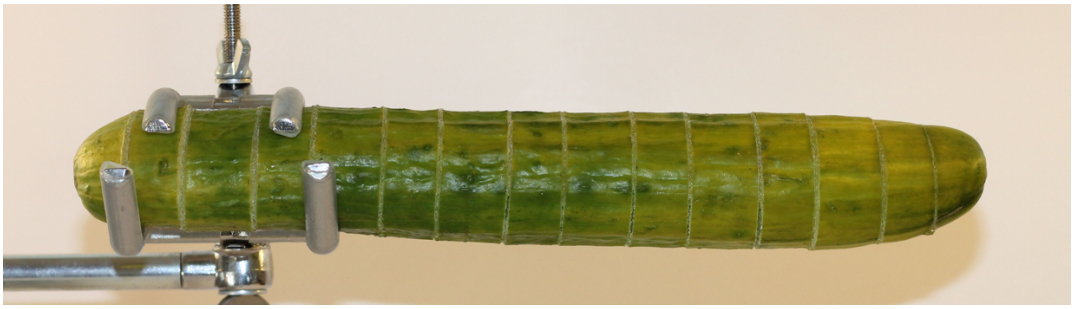
The etheric enzyme activity of the carrot juice is more or less mineralised by the $CuCl_2$ salt

Why is this method a vitality test? In my opinion, it's very simple: if vitality is carried by the enzyme activity of the etheric body, then in the biocrystallization method we have a meeting between the etheric forces and the cytoplasm as the practical image of this. The cytoplasm in which we find all these enzymes is exposed to copper, a poisonous metal. So we have a struggle: on one side, the metal copper, which is extremely poisonous to living organisms the moment we get above a very small level, and on the other side, the plant. The picture illustrates the degree to which the etheric forces, the enzymes of the etheric body, are able to work under stress in a poisonous surrounding. We are testing the enzyme activity of the etheric body with a poisonous salt.

I would like to show you something which is not from biodynamic research, but it shows the wonderful perspective of working in this direction. It's from a Japanese microbiology section, where they are testing how salmonella bacteria repair DNA damage. This happens in every moment of our life: yours, mine, everybody's. It happens for bacteria, and it happens for blue whales and birds and elephants. Throughout Nature, we find enzymes that repair DNA, which are amazingly the same in salmonella bacteria and in the human being. That is because it's in the DNA, and every single day something goes wrong in the DNA, and these enzymes are there to repair it. So these Japanese researchers grew the bacteria in 8 different vegetable juices and the bacteria had a fine time—this is a good environment for them. Then the researchers added a DNA damaging chemical: a mutagen. It is nearly deadly to the bacteria, and the enzymes in the DNA have a very hard time immediately repairing the massive destruction to the DNA strands. After 72 hours—3 days— a count is made to determine if or how the enzymes, the etheric body, was able to repair this crucial damage to the DNA. It's only necessary to count the number of colonies, because a colony exists only if there is bacteria that repaired the DNA

damage and survived. So the colonies are counted, and in this wonderful experiment the Japanese researchers found that the organically fed bacteria had 50% better damage repair in the DNA. (Literature: Ren et al. 2001 Mutation Research 496 83–88.) In my opinion, we can stop all this talk about whether conventional or organic is better. This simple experiment plainly shows it.

I will give a final illustration of vitality. This method is designed to bring the quality question to the public in an informative and popular way, so we keep it very simple. We slice a cucumber, then accurately bring the slices back together, then foil it with household plastic, and put it in a heating chamber at 24 °C for 14 days. This is a stress test. Of course, we expect that there will be some microbial attack on the cucumber, but how capable is the vitality of the cucumber in handling this stressful situation? We test the slice healing ability by hanging weights on the specific slice interfaces of the cucumber, which will eventually cause it to break at a certain point. This tests the ability of the healing between two slices. I can tell you that after 8 to 9 years of research, we had an amazing result only once. The best cucumber that I ever tested withstood 8 kg before breaking. Eight kilograms is a lot, and I was surprised.



Last year I expanded the research to include additional members of the Cucurbita family: one butternut squash, Hokkaido, and pumpkin. Here a total of four samples carried more than 40 kg without breaking! This was completely unexpected. This shows that we have a powerful research tool here. Finally, I can add that last year I was working with Jürgen Fritz from the University of Bonn and Marjolein Doesburg-van Kleffens from the University of Basel. We each made 8 experiments comparing conventional, organic, and biodynamic cucumbers, and statistically, we even saw a difference between organic and biodynamic cucumbers with this way of testing.

If we want to go to the public, we must show them something that doesn't go to the head but goes to the heart, goes to their immediate understanding. Aha! So cucumbers and Hokkaidos, and so on, can have more or less vitality, can resist more or less stress, and are more or less alive. Most people immediately conclude that such fruits and vegetables are better for their health. In my experience. I never met anybody who wanted to eat cucumbers that had completely rotted after 7 or 8 days, like many conventional cucumbers do.

Q+A

Q: You mentioned Empathic Food Testing. I would really like to hear what the state of this knowledge or research is?

Jens-Otto Andersen: To say it very simply, when we read in spiritual science about the human senses, we find Rudolf Steiner describes 12 senses. The lower ones are described as senses that bring the body into self-awareness. For example, we feel when we move our body, and we can see another living being by its movement. We can see the cat jump; we feel that it's moving. This is the sense of movement. The second one is the life sense. It's very straightforward: we feel pain if there's something wrong in the stomach or somewhere in the organs. With our life sense, we feel how our body and our organs are functioning, and if we are pleased with a meal, we have a feeling of well-being. The third one is what Rudolf Steiner calls the sense of balance. Even if we close our eyes, we have an inner feeling of our body and gravity, and whether we are in balance.

For these senses we don't have to be initiated people. We can start in a simple way, and that's what Uwe Geier at the Forschungsring in Germany does. He's the wonderful researcher who developed the Empathic Food Testing method. He started training ordinary people on a panel, which later became an expert panel. The people on this panel could observe relatively small differences in how specific foods affected their inner feeling—that would be using their life sense. Is this carrot welcomed by my life sense? Or is it making some kind of noise in my organs? He developed a questionnaire with 12 pairs of statements. For example, when I eat this carrot, do I feel cold or warm? This covers the observations in the body. And in the cognitive arena, the panel has to answer the question: do I feel clear in my mind, do I have a clear presence, or is my mental awareness a little blurred when I eat this carrot?

With Empathic Food Testing, we are observing what most people are completely subconscious of—the effect of food beyond the taste. There is the potential of actively sensing the effect of what our daily foods do to us. Not “I don't like this” or “This really tastes good.” That is very, very vague. This research has opened up a new field of feeling the quality of food directly in our body. If people with food allergies eat what they cannot tolerate, it's like a slap in the face. Their body will react strongly because they took in something that their body cannot tolerate. Our body actually reacts to what we eat all the time—we just see it more clearly in people with allergies.

This ability can be developed quite far. And if you go all the way and start developing a sort of initiation, then at some point you will meet exactly this, because the way you discipline yourself in thinking, feeling, and willing will automatically bring about a process whereby these lower senses will be at your conscious disposal. This is in everybody's hands, and we can work on it. What we found when Uwe Geier started with the expert panel is that it didn't take very many months for these people, this group, to get really amazing results.

Q: You talked about fruit formation. What exactly is meant by that?

Jens-Otto Andersen: I love that question, because it is the key question in my understanding. It is different in South America, China, etc.—but in our cultural area, agriculture started in Persia and Mesopotamia. Cultural crops were based on wild plants. We stopped being hunters and gatherers, and we started eating cultivated plants. But these plants originally were wild plants. The development went from a wild grass to what became wheat. Fruit formation was introduced into seed formation.

Go to the beach, and you'll find a certain plant: sea cabbage—the wild ancestor of all we have as green cabbage. We have white cabbage, we have turnips, we have broccoli, and so on. Everything that we eat from these cabbage plants are fruits. Fruits can be on the flower level or on the stem, leaf, or root level. If you take green cabbage, you have fruit formation in the leaf area. If you take herbs like oregano and so on, you have a fruiting process which takes place very strongly in the leaf area. So thyme, oregano, and green cabbage have a fruit process in the leaves.

This is the fundamental process, let's call it the fingerprint, of what happened when agriculture came about. With the cultural plants, we are eating the fruit. We should be very aware of this concept and historical background, because we can examine open-pollinated plants, which, of course, are the ones we use in biodynamic farming, and we can compare them to hybrids, which organic farmers use widely, and we find that the open-pollinated plants have a much stronger fruit character. The hybrid products are very standardized in their growth: they grow well, and the yield is quite good, and you get standardized products. But their fruit formation is not optimal, and that means their nutritional value is not as it should be, because humans are supposed to live on fruits.

I'll close with a personal remark. When I started the biocrystallization work, Manfred Klett encouraged me to think about fruit formation, and very soon thereafter, I found out that it is a very fruitful way of working!

Jens-Otto Andersen is a biodynamic researcher from Denmark. After working on biodynamic farms, since 1994, he has developed biocrystallisation and vitality research. Co-founder of the Biodynamic Research Association Denmark, focusing on the connection between farming systems, food quality and health. Co-author of a Danish research report on 'Organic foods and human health' in 2001. Co-founder of a European research group on biocrystallisation in 2001. Co-founder of the international research association Food Quality and Health (FQH; www.organicfqh.org.) Author of two books: *Vitality - from Soil to Stomach* 2016, *A Biodynamic Guide to Food Quality* 2021.