

### Dairy production begins in the soil - Kepa Agirrekoikoa

Kepa Agirrekoikoa produces cheese and yoghurt on a small farm in Bizkaia. The secret behind the excellent quality of his products lies in how he manages the land and the pastures where his cows graze.



Many studies link the nutritional excellence of food with the quality of life of the animals from which it is produced. And that quality of life is undeniably linked to how and what they eat. And if what they eat comes directly from the land, there is another variable to be taken into account: soil quality. The richness and vitality of the soil, combined with the care it receives, strongly influence the quality of food produced for human consumption.

This formula, in which meticulous care is given to each component, is showing its fruits in examples such as Errotik, a small farm producing cheese and yoghurt in Etxano, Bizkaia. The cheeses and yoghurts are made daily by Kepa Agirrekoikoa, who takes his cows out to graze in his own fields each day. Kepa's vision is of a 100% land-based business, and the only way he knows how to do this is by taking care of the land.

"We want to produce food in a way that is best for us, best for the land and best for the cows," says Kepa. He doesn't focus only on the quality of his products; he also analyses the origin, the source — the soil that grows the grass his cattle eat. The entire cycle takes part on his farm. "We work the entire dairy chain, end to end. We work the land that produces the grass to feed the cows, the cows transform that grass into milk, and we transform that milk into cheese and yoghurt." He also sells all his produce directly in the local town and environs, fostering a circular, local economy.

To do this, Kepa implements a grazing method that pays as much attention to soil as to what animals eat: Rational Grazing, developed by André Voisin, one of the pioneers of modern rotational grazing systems. "I have just over seven acres, parcelled into 45 grazing paddocks. They graze in a different paddock each day, so it could be up to two months before they go back to the first one again." This gives both the soil and the grass time to recover.

Voisin Rational Grazing offers two distinct advantages: "Firstly, the cows are eating new grass each day, which encourages them to eat more. By moving them around, their manure is also spread around more evenly, including the grass seeds it contains. We also allow the grass to go through its full cycle. This means a higher grass yield with a more balanced mineral composition. It also promotes soil aeration, because while the cattle compact it when they graze, when they are moved to a different paddock, the roots come back stronger and deeper, and the soil is aerated," says Kepa.

### The transition process

Kepa relates how about 50 years ago, when the farm was run by his grandparents, they were advised to plant pine trees and feed their cattle with store-bought fodder. "Pine trees were really taking off in Bizkaia just then but didn't prove viable, over time. Fifteen years later, my grandparents uprooted the pines, sowed grass and created grazing pastures. But there were no nutrients left in the soil, no minerals. That is actually something we are still having to deal with."

When Kepa took over Errotik 10 years ago, at the age of just 23, he found poor-quality soil that produced very low quality grass. Because of this, he has been trying to recover that land and undo the consequences of that past mistake. "I have always wanted to be part of the land, to protect it, to keep it alive and fertile. Because my grandparents had that negative experience, I have always been aware that I need to recover it, not lose it."



With that in mind, he read up on different methods, until he discovered Rational Grazing. However, he says his land management skills acquired an extra dimension after he took part in the EIT Food Regenerative Agriculture Revolution program. “There is a massive difference between reading about it in books and having an expert there with you, giving you advice and the benefit of his experience. I learned so much, and much quicker than if I had been doing it on my own.”

Kepa's advisor on the program is Orkatz Pagola, who has been with him since the end of 2020 as part of a three-year transition process. “He really understands the soil and he brings you down to earth, in a way. He shows you what you really have and how to improve it,” says Kepa.

The EIT Food Regenerative Agriculture program consists of an initial training course, after which the most promising projects are chosen to participate in a three-year advisory program. “We chose Kepa and matched him with the advisory Orkatz Pagola, who has been with him for a little over a year now. The advisory program consists of at least four in-person visits to the farm, and Orkatz is always available remotely to offer support when problems arise”, says Philip Fernandez, head of the EIT Food Regenerative Agriculture Project. The program also includes a series of soil analyses which help the team of agronomists decide what actions should be taken to regenerate the land.

“We were talking with Kepa to see what we could change or how we could do things better, although he is actually doing great work. I'd say he has a model farm. He is working the land alongside his cows, selling his produce locally, his business is financially viable... We took a look at what he was doing with rotation, and made a few changes,” says Orkatz.

### Rational Grazing for land improvement

Rational Grazing was developed by the Frenchman André Voisin in the first half of the 20th century. It is a sustainable agroecological system that regenerates the land and, at the same time, gives better yields than other pasture management strategies.



The land where Kepa's cattle graze each day is divided up into "grazing plots", using electric fencing. "They eat everything, the good and the bad, all together. So, on the one hand, they get a more balanced diet and, on the other, it regenerates the land," says Pagola. After a day or a day and a half, they move on to the next plot, and only return to a plot after it has had time to recover: "In spring, they come back after around 30-40 days; in colder weather it takes longer, about two months."

When Orkatz and Kepa began to work together they changed the plot system to adapt it to the terrain, helping the soil to regenerate even further and improve the cows' nutrition. "Because it's a dairy herd, we have to be very careful with what they eat. It has to be very protein-rich, so that the cows produce milk without any need for store-bought fodder", explains Orkatz. Business success often lies not in raising your prices, but in cutting expenses. And fodder is very expensive right now. Kepa buys a little, but very little — about 90% of what his cows eat is produced on his own farm.

### Better soil, better milk

As soil fertility improves, so does the quality of the grass Kepa's herd eats. That gives higher-quality milk and, naturally, nutritionally richer cheese and yoghurt. Neiker, the Basque Institute for Agricultural Research and Development, a partner of EIT Food, has confirmed this in Kepa's herd. "When we analysed milk from Kepa's cows, we found a much more interesting fatty-acid profile compared to milk from non-grazing herds," says Nerea Mandaluniz, a researcher at Neiker.

Neiker has been conducting a regenerative pasture project since 2013 monitoring its own herd. In 2021, as part of the EIT Food programme, Neiker set up two pilot projects with ranchers taking part on the monitoring scheme, including Kepa. “The program is having very positive results, as he can tell you himself, in terms of both milk yields and pasture production.”

Specifically, “the fatty-acid profile of Kepa's milk is much healthier than milk from intensive farming, with a significant increase in polyunsaturated fatty acids and Omega-3. This profile is much healthier from a human point of view,” she adds. And that is precisely the aim of the EIT Food programme. “To help farmers improve soil quality and produce more nutritious food”, says Philip Fernandez.

To learn more about the link between the two, Neiker will sample the milk on four occasions throughout 2022. “Once each season, because the animals don't eat the same grass all year round. This will show us the seasonal differences in the same herd. We will also be analysing certain soil health factors, including carbon fixation,” says Mandaluniz.

### **Analysing the soil to define strategies**

To give the land the best, you have to know what it needs, and Rational Grazing is not the only tool available. Soil needs nutrition too and, just like personalised nutrition for humans, analysing its current state is the key to understanding how to move forward. With this in mind, the EIT Food programme takes soil health and biodiversity measurements on all the farms enrolled in its advisory program. “Conducting a diagnosis of the farm enables us to give customised support to improve his pasture and herd management strategies,” says Philip Fernandez.

“We conducted base-cation saturation ratio analysis, also known as the Albrecht method, and we are fertilising the soil based on the deficiencies we found”, says Pagola. The use of bio-fertilisers, rather than just manure, is another one of the changes made on Kepa's farm. The aim is to supplement the soil's mineral content, correcting imbalances and making the most of what it already there.

The Albrecht analysis is used to assess soil pH, organic matter and the chemical elements present in the soil. “In this part of the country, Green Spain as it is known, we are finding high levels of iron which are blocking other elements that we will need to improve soil fertility,” says Pagola.

Another type of analysis is known as Visual Soil Assessment or VSA, which is much more intuitive for the farmer. Kepa learned this method on the EIT Food programme, and it has given him a lot of insight into what happens under our feet. “We take a sample, look at root density and depth, soil compaction, worm population, etc., and compare it against soil that is not being grazed, from a natural area next to the farm”, says Pagola. The idea is to return the soil to its original state. The second analysis will be done this spring, allowing us to compare our progress against the baseline measurements taken last

year. According to Fernandez, “with this tool, farmers can see for themselves the effect of the regenerative practices they are implementing.”

We are happy with the results. In the first year the forage yield was already higher than the previous year. The weather has helped too,” says Pagola. Kepa says that he has gone “from emitting CO<sub>2</sub> to fixing it in the soil”. “That is the biggest change we can make. It will give us healthier soil, healthier pastures and healthier cows. It's a chain.” The project aims to conduct a further analysis at the end of the three-year advisory program to see what improvements have been made. “It's one thing to see it with your own eyes and another to see the data. And the results will be even more apparent after three years,” says Pagola.

### Fodder production and beef cattle

In addition to the grazing area, Kepa's farm has two differentiated plots. One is for producing fodder. “That's just for the heifers. They go in there in late autumn and eat everything. In this plot here we are accelerating all the natural grassland processes, using bio-fertilisers, humic acids and more,” says Orkatz.

He is also fattening the heifers in another area, a little further away. The EIT Food advisors recommended changing the breed of cattle raised by Kepa. “Kepa bought a Scottish breed that adapts really well to this soil. They fatten quicker. That suits us because we are trying to regenerate the less fertile areas where the pine trees had been planted, and it is taking a bit longer,” says Pagola.

Before the program ends, the idea is to change the dairy cattle breed too. “He has bought Danish Friesians, from Normandy. They got here less than a month ago. The idea is to transition little by little. These are smaller animals, they eat less and give a much higher yield”. Pagola believes that the new breed will adapt well to the steep terrain. That was one of the first issues detected. “We can't change the land, so we'll change the breed of cow. We get more milk for less money.” The switch will be gradual, as the milk from the new cows has “a stronger taste” and they want consumers to get used to it.

### Less disease

On its own, Rational Grazing helps to improve the health of the herd and is a good way to prevent disease. According to Pagola, “in the areas where we have improved soil health we are producing

healthier grass. The cows that eat that grass are healthier which means that our veterinary bill is lower."

The EIT Food support program also gave Kepa access to the livestock expert Roger Rabés who recommended certain changes aimed at improving animal health. "We are curing mastitis without antibiotics. Antibiotics affect the quality of the milk and so it cannot be used to make yoghurt or cheese for a few days after intake. Under the new system we are seeing that the milk can be used after two or three days," says Pagola.

### A model farm

Thanks to Kepa's passion for his land and the expert mentoring from EIT food, Errotik has become a showcase of the benefits of regenerative grazing practices. "Nowadays not many breeders can say that they live off the land. This management strategy mimics natural migratory grazing patterns. The cows move as a herd and leave the grass time to recover," says Kepa.

"Even in the first year we noticed a big change in forage production. We are improving the soil, we are fertilising it," says Pagola who believes that the third year will show a definitive improvement.

Nerea Mandaluniz also highlights the way dairy farmers like Kepa manage their herds. "Kepa's farm is on a whole different level. Kepa manages the herd himself, transforms the milk into cheese and yoghurt and sells directly to the final consumer. This model is very important. Kepa is the one who decides what to do on his farm. He doesn't rely on others to tell him what to feed his cows, what to do with the milk or at what price to sell it. This proximity to the consumer is essential. On larger dairy farms, producers depend on a market that is beyond their control, and it can be very frustrating."

EIT Food only has praise for the initiative. "We have seen tremendous improvements on Kepa's farm in terms of soil quality and of herd management," points out Philip Fernandez. He sees Kepa's farm as particularly interesting because of the collaboration with Neiker, which "is helping us to understand the link between grazing practices, soil health and milk quality. We are measuring and monitoring a series of variables to ensure that we are meeting the programme's objectives.

In short, Fernandez believes that regenerative farming and grazing "involves a change of mindset. It is a complex process. Unlike conventional farming, where the crop protection company tells you what to do and when, in regenerative farming, you are the one who makes those decisions, and a lot of factors must be taken into account. You have to observe how different but interrelated elements interact: nutrients with microorganisms, cover crops with cash crops, plants with animals, your personal goals, your money needs, the medium term and the long term... It's a holistic approach. Fernandez admits that it can be a challenging process and, because of that, it is good to have a mentor. For EIT Food, this is one of the most valuable elements of the programme.



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The advisors are also happy with the system and its results so far. “I think it is a model for farmers on the Northern Coast of Spain to follow”, says Pagola. “Kepa is doing a great job, it's amazing. Kepa is showing other farmers from this area that regenerative practices work.

Kepa admits that his career has had a lot of highlights. “But what makes me happiest of all is seeing my cows grazing on good, fresh, tasty grass. When I see them come home in the evening, their stomachs full... It makes my day.”