

“IT IS POSSIBLE TO WORK WITH THEM AND DEVELOP SUCH A MUTUALLY GOOD RELATIONSHIP...”

**Ecological knowledge and the raw milk method among
contemporary Hungarian cheesemakers**

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ABSTRACT

In this study, I examine the complex intertwining of the relationship between man and nature through the activities of a typical group of farmers dominated by urban-rural farmers, the artisan cheese makers of Hungary. I focus on a specific issue, raw milk cheese making, where humans and microbes work together on a daily basis to produce a sellable product. In this context, I will describe how the complex, hybrid nature of the knowledge required for this process of cheese making is produced, and then review the different narratives of Hungarian cheesemakers about the method. I will then show how this method and the particular perspective it entails affects the daily practice of farming, and how working with invisible microbes transforms the fundamental way these farmers think about the relationship between humans and non-human actors.

Keywords: artisan cheesemaking, raw milk cheeses, small scale farmers, microbes, man – nature relationship, ecological knowledge

Introduction: ecological knowledge and contemporary small farms

There are different paradigms and research traditions in contemporary cultural anthropology regarding the topic of local and ecological knowledge, with some theoretical debates between them. For ethnographic-anthropological research on agriculture, a paradigm shift has recently been brought about by the conscious examination of

relations with non-human actors, the focus on interspecies relations, and the emergence of a multi-species ethnographic perspective (Bubandt–Tsing 2018; Haraway 1991, 2003, 2007; Haraway et al. 2016; Kirksey–Helmreich 2010; Kohn 2013; Neimanis 2015; Tsing 2012, 2015).¹ The question is how novel this paradigm shift is, given the abundant examples of human-nature relations studies in both ethnography and cultural anthropology. Ontological anthropology also plays a major role in reinterpreting the relationship between man and nature. It argues that there are major cultural differences even considering the level of basic ontological concepts, and therefore different responses to the problems posed by their locality, which, in accordance with the basic paradigm of anthropology, must be taken equally seriously. Thus, the dualistic separation of man and nature is not a universal human constant, but is specific to certain cultures, and elsewhere this relationship is framed in a completely different way (Descola 2013; Ingold 2000; Kohn 2014; Viveiros de Castro 2014). At the same time, a newfound interdisciplinary perspective led to the emergence of the field of the research of traditional ecological knowledge (TEK). Born from the meeting of biology and conservation and ethnography-anthropology, these studies are very strongly oriented towards ecological sustainability perspectives, looking for ecological management knowledge which can also be applied in contemporary economic practices (Berkes 2018; Borsos 2004, 76-81; Borsos 2020).

These research trends attribute different validity to different forms of knowledge. The research of traditional ecological knowledge has started from validating the knowledge generated by scientific methods and has gradually moved to recognise and legitimise local and indigenous knowledge, creating a common ground between the two knowledge systems. In ontological anthropology, the boundaries between the concepts of man and nature, and between humans and other species, are blurred in certain cultures, or interpreted in a completely different set than these terms of duality. Multispecies ethnography, on the other hand, seeks to include the agency and perspectives of non-human beings in its analysis, with regard to their radical otherness, although confronting a number of methodological problems as a result, since the methodological and analytical tools of anthropology are essentially designed to analyse man as a cultural and social being, and the study of other species is not in its focus, and thus its methods are not sufficient for this topic without including some other disciplines.

Despite their different starting points and approaches, I believe that all three approaches seek a new approach to the complex relationship between man and his environment, and human knowledge about the ecological environment. In doing so, they can provide a good conceptual

1 For the purposes of this study, we focus on living beings as the non-human agents with agency, but recent anthropology also studied the relationship between humans and the non-living environment, and the agency of objects e.g., Gell 1998, Latour 1993b, 1996, 2005.

framework and point of reference for the interpretation and ethnographic analysis of contemporary agricultural knowledge and practices of farmers who are pushing these very radical questions through their own practical practices. In what follows, I will use ethnographic and anthropological methodologies in an attempt to show, through the example of contemporary cheese-makers, what a farming practice that allows space for the agency of other species and takes into account their well-being looks like in their case, how they push the boundaries of human and other living beings, and question the dualistic relationship between humans and nature, and create a new hybrid and integrative knowledge that transcends the boundaries of existing knowledge systems.

It is important to clarify what is meant by *traditional* in this case, which has been problematized very strongly in the contemporary research practice for decades, and it is also important to grasp the *non-traditional* ecological knowledge of contemporary farmers.² In addition to the notion of TEK, a more comprehensive notion of local knowledge has been proposed (Brosius 2009), and the equally comprehensive notion of indigenous and local knowledge (ILK) has also been introduced (Brondízio et al. 2021), but the terms traditional and local knowledge are also used (Varga et al. 2020). TEK research has thoroughly analysed the ways of knowledge access and knowledge transmission (Berkes 2018, 227-249; Turner–Berkes 2006, 497-504; Varga et al. 2017, 252-253), addressed the relationship and intersections between different knowledge systems, both scientific and traditional (Ahnström et al. 2009; Agrawal 1995; Hill et al. 2020; Tengö et al. 2014), and the differences and links between the knowledge of conservationists and farmers, and methods of building of bridges between them (Carr–Tait 1991; Knapp–Fernandez–Gimenez 2009; Molnár et al. 2016; Molnár et al. 2020; Natori–Chenoweth 2008; Raymond et al. 2010; Ujházy et al. 2020). However, significantly fewer studies have focused on the knowledge of contemporary farmers who are not part of a traditional indigenous community or who have acquired their knowledge in non-traditional ways, although there is a body of research on farmers’ relationship with nature and ecological knowledge in general (Beckford–Barker 2007; de Snoo et al. 2013; Ingram 2008; Morris 2006, 2010; Raymond et al. 2016; Riley 2008).

The following study focuses on a specific group of contemporary farmers who have a strong, conscious intention to move beyond industrial agriculture, which subjugates nature and focuses on profit, and to pursue an ecologically committed economic practice that seeks harmony with nature, produces quality products, and is ecologically aware, considering the perspectives and well-being of non-human actors. I am focusing my research on one particular type of alternative livestock farms,

2 There is also an intensive process of inventing traditions (Hobsbawn–Ranger 1983) among contemporary farmers, which makes the question even more complex. I will discuss the issues of tradition and contemporary farmers further in my upcoming PhD thesis.

cheesemakers, which is suitable to demonstrate many tendencies typical of such alternative farmers.³ My questions are: What are the sources of ecological knowledge and how is it developed on these contemporary farms? What is the place of ecological knowledge in shaping economic practice, and how does it interact with other factors?⁴ How and by what methods do they try to develop an economic practice that cooperates with non-human actors and takes their agency into account? How does it affect farmers to consciously attend to non-human actors, and try to cooperate on creating a product together? To what extent are they able to do this in practice, and to what extent do their own human goals and considerations still dominate their practice? To explore this question, I will illustrate the complexity of contemporary ecological knowledge through an examination of a specific topic, raw milk cheese making and knowledge about microorganisms. The human–microbiological relationship has been the subject of a vast interdisciplinary perspective in the anthropological literature in general (Benezra et al. 2012; Benezra 2023; Helmreich 2009; Latour 1993a), and in the research on cheese making in particular is also quite extensive, both from social and natural science and from explicitly interdisciplinary perspectives (Boissard 2003; Donnelly ed. 2014; Donnelly 2019; Paxson 2008, 2013; Percival–Percival 2017). However, these studies have not considered joint work with microbes as an ecological knowledge as such, and the two fields of study have not been linked so far. In the second half of this paper, I attempt to interpret the knowledge of Hungarian cheese makers about raw milk cheese processing as an example for a new kind of complex contemporary ecological knowledge and to show its impact on farming and other aspects of farmers’ lives.

About the research

The research is a sub-theme of my PhD thesis, and I will explain the methodology in more detail there. The subject and field of the research is the network of cheesemakers in Hungary, on which I have created four research “cross-sections” using anthropological and ethnographic methods. So far, I have conducted interviews and observations in 65 farms in the vicinity of Budapest, in the Balaton Highlands and in

- 3 The practices of contemporary Hungarian cheesemakers come from a diverse social and historical background, the details of which I will present in my forthcoming dissertation. However, they are heavily over-represented by first-generation farmers moving from the city to the countryside, the spread of which is a global phenomenon and is becoming increasingly prevalent in Hungary (Van der Ploeg 2018, 21-27, 91-122; Bali 2014; Bartulović 2022; Csizmady–Csurgó 2012; Csurgó 2013; Farkas 2018; Nemes et al. 2022; Svetel 2022; Turk Niskač 2022)
- 4 Along this line of questioning, the topic fits into the main question of my doctoral dissertation, where my main question, which frames the topics, is what factors shape the economic practice and decision making of a farm, how it is composed, and what influences the decision-making of an economy.

Baranya County, and with key actors in the Hungarian cheese makers' network.

Layers of cheese-making knowledge

Before we look at the knowledge of dairy practices of Hungarian cheesemakers closely linked to the ecological environment, I think it is necessary to show what other factors shape their specific recipes.⁵ The product range and recipe set of contemporary Hungarian cheesemakers is formed by a series of interrelated, often difficult to disentangle factors, of which the interaction with the ecological environment is an integral shaping factor, but only one of the issues that influence complex decision-making. The knowledge of the cheesemakers contains but a few elements of oral or practical knowledge transferred within the family, and therefore has weak links to the traditional knowledge system in the above sense. At the same time, there is a conscious process of reconstruction of the cheese-making tradition in the Carpathian Basin under way, using both written and oral sources. The specific individual cheese varieties are developed in a global space where a very broad range of global knowledge of dairy processing and cheese making is potentially available.

A novice cheesemaker can take the first steps in the craft from a very wide accessible range of sources, with great differences in both approach and practice. In all of this, of course, there is some contingency as to what knowledge reaches a particular farm and forms the basis of one's own practice, and is also very much embedded in one's own life history, so that specific recipes are often strongly linked to a distant but important point in one's personal life story in the global space. The most important sources for getting started are the internet and specialist books, especially dairy textbooks available in Hungarian, often in local libraries. Among the Internet resources, videos are particularly valued, where the practical steps can be learned more experientially through the use of moving images than through text alone, although this is of course no substitute for personal, hands-on learning.⁶

At the same time, it is clear that, after a while, when immersed in the practice of the craft, such more easily accessible sources are not sufficient to provide the depth of knowledge required by cheese makers. Many cheesemakers have developed a need to better understand and thus use the

5 A detailed analysis of the cheesemakers' knowledge acquisition is only included in my forthcoming dissertation, here I will only outline the most important factors that are key to understanding the place of ecological knowledge.

6 Knowledge on the internet is part of a sense of oral knowledge in a new media space, which can be approached as mediatised orality (Zumthor 1990) or "digital orality" (Lafkioui–Merolla 2005). However, the scope of knowledge transferred via the Internet is limited due to the highly physical and sensory nature of cheese-making, which makes generative transmission an important way of passing knowledge (Goody 1977).

microbiological processes in milk to develop more complex and exciting flavours, to improve product development and to achieve consistent high quality. There is also a growing demand for the development of cheeses with a unique flavour, more embedded in the farming location, based on local traditions and thus more in harmony with the ecological environment, with a local character and uniqueness, which will lead us to the theme of raw milk cheese making. A number of providers of deeper and more specialised layers of knowledge acquisition have thus emerged in the knowledge economy market.⁷ The gap left by the end of the autonomy of the former Csermajor vocational school, which had a long history, was filled by the formal training of people with an OKJ qualification,⁸ but this was often not able to meet the knowledge needs of small-scale, family farms, so that several specialised “private” providers have appeared on the market. Among them, there is one that offers market-based training specifically for beginners, with the possibility of practical training, which can be used to acquire skills that cannot be acquired through written or video training. This entrepreneur also sells tools for cheesemakers as part of his business. One of the protagonists of our story, a leading figure in the national raw milk cheese-making industry, has also been involved in the practical transfer of knowledge, but he has not been doing this on a market basis and has abandoned the activity some time ago due to a lack of capacity and, as we shall see, a different approach. In addition, due to the increasing demand for knowledge, the Cheese Makers’ Association regularly invites international cheese making specialists to give practical demonstrations of the techniques of a well-known international cheese type.

These official sources of knowledge, too, convey knowledge from very diverse and complex sources, much of which comes from the global arena, for example, the learning of established internationally known cheese varieties that are in line with global gastronomic fashions, and inextricably mixes traditional ecological knowledge with modern scientific and food knowledge about cheese-making technology. The cheese varieties, which originated in the global area and which have now become absolutely international, were also once learned in formal forums, and were developed through practical learning in cooperation with the ecological environment, using natural scientific methods to understand the processes developed in a specific local area, reproduced and transformed over time (for example, by microbial cultures analysed and cultivated under laboratory conditions and then commodified as such, available for purchase on the market and integrated into global value chains). A significant proportion of them are still strongly linked to the localities that originally created the cheese

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8 National List of Qualifications (OKJ for short) – this lists the qualifications that can be officially obtained in Hungary. The so-called OKJ courses are one of the most widespread forms of adult education in Hungary.

varieties, and are even legally protected by systems of origin protection, so that even after the process has been reproduced, their local variety cannot be officially marketed under the name of the original cheese variety, but only with the term “like”. Completely new, original cheese types are also regularly created: “*for example, a bit out there [...] is a cheese called amnesia, which... One, I had an extra cheese wheel, a fresh cheese wheel, which didn't fit in the thermo-box, and I put it in the fridge... we use Parajd salt. And three weeks later I noticed it was there, and it was fucking delicious. One... it was cold, it didn't sizzle as much, it was softer, but it wasn't that stinky rouge. And then I recreated the occasion or the circumstances several times, and then I got it, same taste, same texture, everything, it came out. And then I called it amnesia, because I left it, and now I have a fan base.*” (man, Hajdú-Bihar county, 2022)

For them, the basic measure of knowledge is basically its practical applicability, that is to the extent to which it serves the ongoing sustainability of economic practice, the creation of a product that satisfies their need for creativity but is also tasty and sellable. In this context, it makes no difference to them whether this knowledge is the result of natural sciences and laboratory methods, social science analysis, the experiential knowledge transferred through generations of local shepherds, a textbook, or their own practical experience. They do not distinguish between these categories, if the element of knowledge proves to be useful in their practice. Each layer of knowledge and each category, is equally valid or invalid from their very practical point of view, judged solely by its practical utility. This knowledge, dominated by practicality, is very hybrid, where elements from different sources “react” with each other and dissolve into a new, synthesised knowledge.⁹

However, it is a common practice – and approach – that the cheesemaker has to adapt these “general” knowledge elements and procedures to his own environment, farm and raw material, which is why there are no really stable recipes on a farm, as all these factors are constantly changing and have to be adapted to. Practical learning, the continuous development and acquisition of knowledge related to one's own locality, is therefore a constant task on every farm. The elements of general knowledge are adapted through the practice of daily work, where a highly practical, site-specific knowledge is developed, embodied through repetition, movement patterns, and generated through the senses of the cheesemakers.¹⁰ Through all this practice, every farm is constantly working with non-human actors and producing specific knowledge that is specific to and related to the locality and valid there. In comparison to this, however, raw milk cheese making brings a qualitatively different, even more complex, relationship of cooperation with the non-human environment.

⁹ It is no coincidence that hybridity is a characteristic concept of Bruno Latour's thinking (Latour 1993a).

¹⁰ Very similar processes take place creating other fermented products, see Hey 2021.

“It is possible to work with them and develop such a mutually good relationship...” The question of raw milk cheeses

One of the central themes within the network of cheesemakers, which is also a major determinant of specific economic practices, is the use of raw milk cheesemaking, i.e., the use of locally grown microbial cultures from the local natural environment in the ripening of dairy products. The topic was “offered” by the field itself: it had already come up spontaneously in the first interviews and was often mentioned at various events, so I soon consciously included it in the interviews, even for those cheesemakers who did not mention it themselves. During the research period, the cheese-makers who were committed to the subject also set up their own organisation, the Raw Milk Cheese Makers’ Guild.¹¹ The Guild also runs its own regular event, the Raw Milk Picnic, but the Cheese Makers’ Association has also become increasingly involved in the theme, for example, at its annual major event, the Cheese Showcase, and the members of the Guild have also included the theme.¹² Based on the fieldwork, I see that the more connected someone is to the network of cheese makers, i.e., the more central and opinion-forming position they occupy in the network, the more likely they are to take a stand, to form an opinion either for or against the use of raw milk cultures. Virtually all of the actors I identified as node actors had extensive knowledge of the topic and expressed strong, reflective opinions on it. In what follows, I present these distinctive narratives about this complex ecological knowledge, which are important because they shape economic practices, specific recipes, product ranges, and marketing strategies, but also have other, personal effects on their bearers. Those who operate in relative isolation, producing some of the simpler types of cheese, often take no position at all, are not familiar with the defining narratives described below, or opt for the safer, more predictable method requiring less expertise and practice, preferring to work with heat-treated milk and purchased factory-made colour dairy products, following the simpler recipes they know.

The method of raw milk cheese making is that the cheesemaker does not heat the milk before making the cheese, but lets its own culture work, and produces the microbial cultures used in the cheese making process from the milk itself, and often allows microbes from the local natural environment to take over during the ripening process. The importance of this method lies in the fact that, on the one hand, the culture comes from the natural environment of the farm, as opposed to industrially produced colour cultures, and, on the other hand, it

11 <https://www.facebook.com/Nyerstejes.Sajtkeszitok.Cehe/> (Accessed 29 April 2023) This topic is also discussed in the chapter on association life and the network of relationships in my dissertation.

12 <https://www.facebook.com/sajtkeszitok/posts/pfbid0sAHHAfSsrfc3KZoubniR2fK2mwZyewkAvkGqckGc1NQWffBvPx8ujfVmEJPCy51Hl> (Accessed 29 April 2023)

produces a much more varied and necessarily different flavour of the place, which is typical of each cheese. Microbes are thus derived from the local ecological environment itself, not produced in a laboratory and not introduced into the economy through global value chains. At the same time, because few people are engaged in pure grazing, the issue of raw milk does not arise at all in many places: *“And there are not really any milking animals in Hungary at the moment that really only feed on feed from grazing, because they could not provide milk of that quality, because there is not that diverse a flora here in Hungary anyway, precisely because of the climate.”* (woman, Veszprém county, 2019).

The idea is also in line with international trends and has been taken up on the global stage, with much international literature on the subject (Énticott 2003; Paxson 2008, 2013; Percival–Percival 2017; Donnelly 2019). There is a close link with the ideas of the various trends in organic farming (permaculture, bio-dynamism), and terroir, the latter being a topic that is also very much in touch with the domestic public discourse and is often raised.¹³ The topic also raises complex legal and regulatory issues, to which different responses have been developed in different countries over the past decades, strongly influenced by different economic and social historical backgrounds. Two typical examples: in France, where cheese-making has a strong historical tradition, the production of raw milk cheeses is legally established, while in the United States, where industrial agriculture is a much more dominant trend and small-scale cheese-making is a relatively new phenomenon, there is a serious struggle to establish the legal status of raw milk cheese-making. In Hungary, however, the trend has not come from the global arena, although the global trend is clearly contributing to its spread. In the domestic network, it is clearly linked to the activities of one farmer who is central to contemporary Hungarian cheese making, and who I will refer to hereafter by the code LG.

Layers of raw dairy knowledge

The knowledge of raw milk cheesemaking itself consists of several closely related layers, the mixing and syncretic nature of contemporary cheesemaking knowledge in general applies to this particular, separate body of knowledge, but at the same time, additional sources emerge beyond the general ones. I will illustrate how the complex and, in its complexity, unified knowledge of microbiology is created through the life history and the development of the knowledge base of the leading Hungarian figure of this movement.

LG comes from a multi-generational family of farmers in Békés County, and a significant part of his agricultural knowledge comes

¹³ For example, among the themes of the II, Raw Milk Picnic: “the role of terroir in cheese making” <https://www.facebook.com/Nyerstejes.Sajtkeszitok.Cehe/photo/s/a.930152064378547/930151384378615>. (Accessed 29 April 2023)

from here. This traditional agricultural knowledge has been developed over the decades through practical learning from his own production and dairy processing, as well as through professional food industry expertise and teaching activities, while at the same time his knowledge of ethnographic and food industry literature on the subject and his own conscious work in the search for the carriers of traditional dairy processing knowledge, in fact through ethnographic methods, were decisive in his move towards raw milk. Much of his knowledge also comes from pastoralists and farmers in the lowlands and Transylvania, and he combines this with modern food, dairy and microbiological knowledge. He is also open to international cheese-making knowledge, having spent a considerable amount of time studying with a French cheesemaker. Her knowledge is therefore very complex, synthesising elements from the local and global scene, and the results of a professional, scientific-food industry knowledge set and a traditional and practical learning knowledge set. The modern, industrialised food and dairy processing system, with its knowledge and recognition of its virtues, is deeply criticised by him, particularly for extreme practices (e.g., food adulteration, raw materials of a very poor quality), and he has been guided by moral principles, as discussed earlier, towards small-scale, close-to-nature forms of farming. His central role in the network was largely due to the fact that he shared this complex knowledge over decades, an activity which has been discussed in an earlier chapter, and which has had a considerable impact on contemporary cheese-making in the Carpathian Basin. Farms with a narrative and farming practices committed to raw milk cheesemaking that I know of also have a concrete personal connection to him, often learning the basics of the craft from him, or even more complex knowledge, making him personally influential in their views on raw milk. In general, those who reflect on their own farm practice and work with a different method based on their knowledge of raw milk practice also recognise his knowledge and importance in shaping the present and future of domestic cheese making. His charismatic influence is also demonstrated by the fact that his son, a geographer with a degree in town planning, is continuing the cheese-making workshop, his father's legacy, with the same approach, while his daughter is carrying out scientific research into microbiology.

Among the sources of ecological knowledge, we therefore see the farmer's own knowledge, based on the transfer of practical knowledge from his family, on which he builds his own daily practice and thus develops it further. At the same time, he has consciously collected and used the knowledge of other bearers of traditional ecological knowledge (shepherds, elderly farmers) in his own practice. However, this is not sharply separated from the scientific, food and natural science, microbiological knowledge, the two together forming this new kind of ecological knowledge, where natural science has helped to discover the microbiological background and explanation behind the former practical discoveries and methods and experiences. All this results in a new kind

of syncretic knowledge, radically different from traditional ecological knowledge based on practical learning and personal knowledge transfer, and also from scientific knowledge based on experimental methods, but using elements of both, and reconciling the two in the daily, practical knowledge creation process of farming, where a kind of highly applied knowledge is created, where a saleable, tasty product and a livelihood are at stake.

Discourses on raw milk

This ecological knowledge is clearly a major determinant of economic practice, but it is also intertwined with a range of other internal and external factors, and together they result in the concrete methods used in daily practice. One significant narrative in this context, which is of course clearly linked to LG himself, is in favour of raw milk cheese making and wants to *create* a Hungarian cheese culture based on it. This approach closely involves the quality of the milk, i.e. *hay milk*, which is also linked to the grazing and feeding of the animal. If the animal does not graze or is not fed with fibre feed from the local environment, which is appropriate to its natural physiological function, then there is no point in raw milk concepts that seek local characteristics and flavours from the local area, where the milk produced in this way is the source of the microbial stocks needed for processing. LG himself stresses that this method is suitable for small-scale farming, is strongly linked to this scale, and is understood as an environmentally friendly method that works with nature. The essence of the discourse is summarised by LG himself: *‘A small movement has started in Hungary, and that is the Raw Milk Cheese Makers’ Guild. It’s about the fact that we’re fed up with Danisco cultures, this kind of culture and that kind of culture. And we think that the traditional... so a nation... When did it survive, when did it become great? A cheese nation, great? When it took on itself. It took its own cows, its own pasture, its own microclimate, and made the traditional product out of it. We missed that era because, well, there are many reasons. But we’ve got to the point where... 150 years ago the French... now we’ve got to the point where maybe we can create something. Based on our tastes, based on our culture, based on our animals.*

Because I believe that Hungarian cheese starts with pasture, Hungarian herds and our own, home-grown cheese. Which means that we can produce mesophilic strains from, for example, plain sheep’s milk, and the thermophilic strains we cook, so to speak. So, from the whey, from the fresh whey, we thermophilize it and that’s how we make the strains. And so, this raw milk movement is now gaining quite a lot of momentum and more and more supporters. And so, something’s started. And it turns out that you can make these products well. They taste good, they’re unique. It just takes a different approach. [...] Small farms that, for example, work with, I don’t know, ten or twenty cows, they can do these things.

I lived in the world of industrial cultures as much as anyone else. And it's actually a philosophy of life, that we want a sustainable economy. And the idea of a sustainable economy is, you know, to take only what we need from nature. Now, that's the approach that made me, for example, think that it's important for cattle to graze outside. And I sleep here for six months, and I'm here when I could be living in much better conditions in the village. But it's important to me that the cows are comfortable out here. And then the direct consequence of that is, well, don't be a breeder.

No, but I beg you! I, if I were to put it very simply. If I want to make an Emmental cheese here, with the technology that is in Emmental, with exactly the same technology, with exactly the same strains, interestingly enough, it won't taste the same. It won't be the same. It will be something similar, but not the same. Why is that? Because the terroir is not the same. The pasture, the breed of animal, the composition of its milk... so the amino acid sequence, or the fatty acid composition is not the same. So, it's not the same product. So, what's good? Is it to mimic the world and try to follow it... Or we can make a product by ourselves, for ourselves. And to do that, we have to have the world of the raw milk that we represent. So, it's an absolute difference in approach. And a lot of people don't understand that. Well, if you don't understand, you don't understand. It's none of my business. Those who do understand, they'll manage. [...]

And then one of the people, one of the journalists, asked me once... what's the difference between an industrial cheese and an artisanal cheese? And I said, »Well, it's a difficult question, but I'll try to answer it.« With an industrial cheese, when you make an industrial cheese, what do you do? First, we pasteurise the milk. What do we do with that? We kill all the microbes in it. We take it, we put an industrial culture in it. The industrial culture, by the way, will usually contain two or three, four or five species at the most. Each species has its own enzyme, specific enzyme. Because the point is that they each give a different enzyme. And if you have a different enzyme, then you'll have a different amount of substances produced, or substances produced, and a different taste. Now, these five will always be the same. And usually these are not so dispersed strains that they give you a horribly broad spectrum of flavours. And when one of the customers comes and says to me at the market, »Listen here, young man«, he says, »I buy cheese at the store. And when I buy cheese, a regular cheese, whatever variety or name you see, it tastes pretty much the same. Why is that?« Well, I tell him, »it's because they're made with industrial cultures«. »And I taste your cheese, it tastes completely different.« I say, »because in our raw milk cheeses, nature gives us a million and one variations of which microbes are in it.« Now, it follows from this that only what is given there, in the conditions there, with the technology there, with the climate there, will proliferate. And, therefore, the flavours will be specific. Only the specific flavours that are specific to that place will develop. And that's the difference. That's the difference, and a very big difference.» (man, Békés county, 2019)

The motivation behind the practice is the need for cooperative farming with nature and the closely related moral principles, as well

IT IS POSSIBLE TO WORK WITH THEM

as the creativity experienced in *experimentation*, and closely related to this, the search for *exciting, unpredictable and natural* flavours: “*this is when, that’s why raw milk is good in cheese making, it might not turn out the way it should, and it will turn out better than it should. Well, this raw milk cheesemaking, it doesn’t always work out that way, but it still turns out something, and it’s very much liked. There’s a lot of randomness factor here, so no two cheeses are really the same. [...] We do it on purpose, we don’t do anything with it. But we leave it as it is, and then, and then all sorts of stuff gets on it, and then it gives the whole cheese a nice wild taste, actually.*” (man, Békés county, 2019). Another important factor is that there is indeed a niche market for these products. If this were not there, the whole system would be tipped over on the sales and livelihood side and would not be sustainable. The starting point for this ecological thinking is also to create products that are both suitable for the ideas of their maker and at the same time sellable, and in this sense economic sustainability is a necessary condition for the implementation of ecological principles. Some consumers are particularly attracted to and demand products made in this way, precisely because they have a stronger, more distinctive flavour than cheeses made with milk, but raw milk cheesemakers themselves stress that not all consumers will be able to accept these products, and that the market can therefore only absorb a limited number of cheesemakers who use this method. However, without a real market demand, this method would be limited to home cheesemaking and would not be able to cross the market penetration threshold. In addition, the need for a deeper knowledge of raw milk use is stressed, and the lack of it not only makes the result unpredictable and difficult to produce any consistent quality, but also potentially dangerous if the cheesemaker does not recognise the presence of pathological microbial strains in the product.

Another identifiable narrative is equally aware of these aspects, recognises and acknowledges the role and activities of raw milk producers, but does not apply them in its own practice. This is generally due to the different scale and volume of production, the incorporation of consumer needs and marketability into practice, and the addition of moral, sustainability and individual principles to market considerations. This approach does not reject raw milk principles either, but only questions the market value of the products so produced and does not consider them to be compatible with its own established marketing practices.

“*The raw milk producers are very nice, I like them, but some of their products are inedible to me. So it’s not enjoyable and it’s not stable. Because we are not in that culture. It’s no coincidence that we didn’t have that culture of aged cheesemaking back then. Sour cream, cottage cheese, button cheese... our bacterial culture is different. Whether we will be able to swim against the tide and find our own way in this is still to be seen.*” (man, Veszprém county, 2019)

This other narrative does not clearly define itself in opposition to the raw milk approach, but it does bring in economic, market aspects, the question of marketability. It is a widely accepted fact that the result is more difficult to predict when making raw milk cheeses, and this is what gives raw milk cheeses their beauty and interest. At the same time, there is even a risk of health hazards: this is because the method presupposes the cheese maker's knowledge to be able to identify potentially dangerous micro-organisms for the consumer and to separate them from cheese cultures that are merely exciting and hitherto unknown flavours. According to raw milk producers, this risk can be minimised, and this minimal risk is necessary for life: *"It's there, so there is a risk, I won't say, but, for example, my father used to say that acidification eliminates half the risk, salting eliminates the remaining 25 %, another 25 %, and then there's seasoning, surface treatment, and, and he used to say, 1 % is left. But you have to leave that."* (man, Békés county, 2019) However, the lack of consistent quality is a major threat to the service of consumers who are looking for familiar, predictable tastes (and who are basically socialised on the offer of retail chains). This narrative also draws attention to the fact that although large Western cheese factories, often using professional technology, also worked with rennet from nature and former smallholder farms, they have stabilised it over the years and have been able to create a consistent, familiar quality – in which, it is stressed, the consistent and predictable quality of milk, consistent over a large geographical area, has also played a major role, which is also not yet a given in this country.

A third identifiable narrative on the issue focuses on the individualistic approach to economies, bringing in the issue of individual taste. In the previous chapter, I showed that cheese makers potentially already have access to a global market of recipes, from which they are free to choose, constrained only by their individual capital, and thus make conscious choices about the type of cheese they make. The use of raw milk rennet limits this and determines the outcome, giving a greater role than individual creativity to the local microbiological environment, as it were, at least in part, "passing the baton". However, if one wants to produce a typical, for example Swiss, cheese to one's own taste, and in a stable way, one has to use a different method and cannot leave so much of the control to the local microbes:

"Milk has all the bacteria in it that... that make it suitable for making cheese. That... that makes it suitable. But if you rely on these... these bacteria, you'll have a different cheese every day. And because I like these Swiss cheese flavours, so I... And in the cheese making process, one, I prefer the more intense, longer-aged ones. I realised that I had to have technology with it [...] No, it really has so much deep biological background and so much terroir and everything. So, you could say a lot of mystery, so we don't know how these beautiful cheeses have turned out and are now relatively stable. Of course, we're always learning, always consulting. Now we can make a

stable, consistent quality, which again, I think is a relatively big thing among artisans.” (man, Pest county, 2022)

The use of the raw milk cheese-making method, the extent to which one lets go of the reins and hands over control to local cultures, is therefore, as with all other issues, the result of a very complex, individual and multifactorial decision-making process on a particular farm, determined by the contingencies of one's own life history, individual moral and economic principles, and the opportunities presented by the external environment. At the same time, raw-milk cheese-making is still a legal grey area in this country, too, and is not really well regulated, so whether farmers have the legal and regulatory freedom to implement their own practices in the given legal environment with regard to the issue of raw milk is questionable.¹⁴

“I always want to be a micro-organism for a moment...” A change of mindset in farming

Attitudes towards raw milk cheesemaking therefore range from complete, categorical and conscious rejection, through sympathy with the idea in principle but not applying it in practice for their own human-economic reasons, to conscious and full validation and integration in the economic practice. In the following, I will use concrete examples to show how this change of mindset and how this new approach is manifested in the concrete methods of making cheeses among Hungarian raw milk cheese producers.

The raw milk method cheese makers thus have the experience of working with other beings on a daily basis to create products, they enter the imagined perspectives of other beings, and they partly hand over the baton to non-human actors, giving them space to shape the finished product, which leads to a less predictable outcome. While the end goal is of course very much framed from the human perspective, as it gives them new, exciting, previously unprecedented, ever-changing tastes. In order to achieve this goal these farmers are trying on a daily basis to “think” radically with the minds of non-human actors: microbes. They are also trying to understand the microbe's acts by comparing it to human behaviour, by human analogies, and thereby trying to build a new kind of relationship with them.

The approach also sees the microbiological environment as one with agency that shapes its activity, which in fact communicates through the flavours it produces. In this interpretation, the final product is not solely the creation of the farmer, the result of the mere use or domination of nature. Rather, it is a co-creation, a co-production of the environment and man, where the environment also shapes the final product:

¹⁴ I will discuss this issue in more detail in the chapter on the relationship to the regulatory environment in my thesis.

“I also saw through the whole system of bacteria working... How I... so it’s a... how do I say this? It’s a bit like, say, permaculture, that I don’t cut all the trees out of the plant, but I look at the... I look at the whole thing with transcendent serenity and I see through the workings of it, and I don’t kill the whole thing, but I understand the processes and I help the good processes. Or the processes that are important to me. That it’s possible to work with nearly 1000 different kinds of bacteria. Yes, at first, I also write in these cheese groups that I need the... the bacteriological knowledge. No, not a... not a, I don’t know, cardiac surgery or nuclear physics. You have the bacteria, you have the role of the bacteria, and if you understand that, then you can... you can work with them and you can have a mutual good relationship. Obviously, it’s different if you have a... a girlfriend, obviously that’s a different relationship, but... but you can have a similar good relationship with bacteria. So yes, yes, yes, that’s what I see in my picture, this whirling together, this dance... You can do this together, and then it can be good...” (man, Hajdú-Bihar county, 2022)

This results in a kind of insertion into the perspective of other natural agents with agency – in this case, microbes: *“But here I am more interested in the activity of processes, micro-organisms... It’s such an eternal thing. I always want to be a micro-organism for a moment, to jump into the milk, to wonder, my God, what does it feel like to be cold? Do you want warmer? How does it reproduce? What helps it reproduce? It’s so fantastic, and especially with moulds, it’s so... I could sing ode to it. I think it’s a wonderful thing.”* (woman, Pest county, 2022)

Raw milk cheesemakers also leave more room for microbial and, more broadly, environmental influences in their process, strongly affecting the types of cheese they make. In the following, I will show what this means to their practice, using the example of a raw milk farm in Békés County. The milk comes from their own herd of Hungarian Simmental cattle, grazed and fed with alfalfa, so that the raw material is adapted to the conditions and microbiological environment of the local area, and its properties determine the processing and the range of products. The cheese-making workshop is not designed as a sterile environment, free from environmental influences, but to encourage the microbes in the environment that are involved in the cheese ripening process to thrive: *“and in fact they are the ones that give us the taste that we have. So, we don’t want to wipe them out. That’s why it’s in the front, it’s not tiled in the front. Everything sticks to that brick, so there’s no point in cleaning it.”* They don’t use any external culture, they just rely on the microbes from the milk and the environment. *“So, we don’t even make yoghurt, well, here, there are no other bacteria than ours. So, it’s also interesting that, for example, in the ripening or processing plant, it’s still, even if you clean up, but there are still different bacteria and fungi everywhere in the air.”*

In addition, rather than trying to reproduce established cheeses as faithfully as possible, they often create their own new varieties. This is also part of a general attitude that sees chance not as a mistake but as an opportunity: *“That’s why raw milk is good for cheese-making, because*

it might not turn out the way it should, and it will turn out better than it should. [...] There are a lot of random factors, so no two cheeses are really the same. [...] It doesn't always turn out the same, but it still turns out something, and many people like it." When a recipe is used as a starting point – which is usually some local recipe from the Carpathian Basin, not a global one – there is also room for deviation: *"So now it's turned into a sort of sticky goo, but otherwise it should be drier. Well, it's raw-milk cheesemaking: it doesn't always turn out that way, but it turns out something, and they love it."* Other times there is no recipe at all, they just experiment to see what happens with different processes: *"But you can see that it's flat, so it's made that way because it's a different kind of cheese because of the shape. Even though it's made the same way, almost the same way as the knob, but it's going to have a different shape, it's going to have a different water content. I treat it differently because it's been washed, it's been packaged. And even though it's made almost the same way as this, it's still going to be this."* They will then try to reproduce in the future the ones that suit their own tastes and the public's and are therefore sellable. Two examples of how they arrive at a stable, named and regularly produced cheese of their own: *"It's not really made as a soft cheese, because it was developed – that's the story – when we weren't here with the cheese, but in another house, a small house, my mother left a gomolya in the fridge and it got some rouge mould on it. And then my dad had a card party and they took all the shit out of the fridge that was wrapped, and everything. And then they said that this cheese is fucking great, and that's how [...] Büdöske ('Little Stinky') came to be [...] But there are other cheeses that I make, maybe I can only show you one of them, this kind. We used to make it on purpose, without doing anything with it. We just leave it as it is, and then, and then all kinds of stuff get on it, and then it gives the whole cheese a nice wild taste, actually. And a nice rustic look."* (All quotes in this chapter: man, Békés county, 2018.) The knowledge to recognise potentially dangerous microbes and to eliminate their effects is very important in this.¹⁵ Humans are not left out of the story, they are basically in charge, but microbial activity is playing an increasingly important role.

Raw milk cheesemakers often consciously, and sometimes unconsciously, try to adopt a multi-species perspective in their everyday economic practice and thinking. All of this, I think, has a broader impact on their outlook, their world view. The outlines of a new, deeply lived ecological identity emerge from the interview quotes above, where these farmers give evidence of a whole new narrative and way of living that goes beyond the simple, dualistic dichotomy of human-nature. Raw-milk cheesemakers invest non-human actors with human-like agency, talking about them as equals, listening to their signals, and allowing

¹⁵ It is a far-reaching question that cheese makers are also pondering is what constitutes a microbe that is dangerous to human health. Increasingly, biological evidence suggests that humans are not uniform in this respect and that there is extreme individual variation in the way people are affected by exposure to different microbes (Donnelly, 2014).

space for their actions to shape their own economic practices, creating radically new relationships. At the same time, the human is posited as a part of nature rather than as its master. Through eating and perceiving tastes, he comes into contact with the microbes, and at the same time he brings the external microbes into himself, which thus become part of his own organism. A new image of economy is also outlined, where the well-being of non-human actors, even of the microbes, becomes a matter of fact, an important question, in addition to the aspects of human subsistence. All this leads us to questions and issues that go beyond the remit of anthropology. It raises the question: what are the psychological effects on human consciousness of this daily connection with the aspects of other living beings, of imagining in the situation of radically different living beings? Although there are obvious limitations to our knowledge and understanding of the perspectives of non-human actors, a kind of cross-species empathy is beginning to emerge here, which may be particularly relevant in the context of the ecological crisis and may also play a role in its resolution.¹⁶ In many ways, their practice can serve as an example and model for a more sustainable approach and practice of agriculture.

Summary, perspectives

This paper, specifically based on the perspective and methodology of cultural anthropology, aimed to show the evolution of farmers' perspectives and knowledge in the process of working with non-human actors. At the same time, similar research opens up enormous interdisciplinary perspectives: human activity in this arena shapes the microbiological environment itself, creating a kind of self-domestication, a symbiotic coexistence, from which humans, as supra-organisms composed of symbiotic cooperation between human cells and microbes, can benefit, gain a better understanding of their own existence, and even take steps towards a healthier way of being, in greater harmony with their environment. This opens the door to research directions where the natural scientific method can be used to explore the interaction of microbes and humans, humans and farm animals, humans and ecosystems, in the context of contemporary small farms. This approach can also make a major contribution to the development of new, more sustainable farming, and its practical benefits have enormous potential for application. At the same time, however, I believe that anthropology must always take account of its field of competence when it comes to the issues and terrain of interspecies relations and the relationships between human and non-human actors, and that if it does not want to move into the realm of pure fiction, it must concentrate on the areas where

¹⁶ Similar questions are also addressed by Csaba Mészáros in his study on the possible role of ontological anthropology in the search for solutions to the ecological crisis (Mészáros 2020).

it has methodological and theoretical competence: the interpretation of human perspectives, where intersubjective understanding also has its limitations, but does not require a radically different methodology than that of non-human actors. If human and non-human actors are to be interpreted within the same interpretive framework, this requires both a genuine natural scientific method and approach, so the future of the subject clearly points towards interdisciplinary, joint research. Such research has a huge perspective and relevance, not only for the surviving traditional knowledge, but also for the contemporary practices presented in this paper and the development of a new, sustainable agriculture for the 21st century. Developing forward this present research can also be best imagined along these lines.

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