



Heroic Fermentations: Multispecies Symbiosis in the Vineyards of the Susa Valley

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Abstract: In the context of the Susa Valley, an Alpine area in Western Piedmont where so-called “heroic viticulture” is practiced – characterised by steep slopes and complex, entirely manual agricultural labour – this paper explores the invisible role of yeasts in the production of natural wines through spontaneous fermentation. Adopting a multispecies ethnographic approach based on interviews, participant observation, analysis of production practices, and sensory narratives, the essay investigates the interconnections among humans, microbes, environments, and local knowledge that co-produce wine. Integrating the perspective of *zymurpolitics* (Furness 2022; 2023), fermentation is interpreted as an ontopolitical space of negotiation between microbial autonomy and human control.

The research highlights the tensions between oenological standardisation, disciplinary constraints, and the desire to maintain a living relationality with the cellar’s microbiome, showing how the “heroic” viticulture of the Susa Valley constitutes a form of epistemic and ecological resistance in which yeasts participate in shaping quality, territorial identity, and more-than-human labour.

Keywords: Susa Valley; Heroic viticulture; Spontaneous fermentation; Yeast; Zymurpolitics; Non-human labour



“Working the land every day is a true curse of God [...]
Old Murica stood at the head of the table, serving food and drink to the men gathered around him.
‘It is he,’ he said, ‘who helped me to sow, hoe, reap, thresh, and grind the grain from which this
bread is made.
Take and eat, this is his bread.’
Others arrived. The father poured wine and said:
‘It is he who helped me prune, sulphur, hoe, and harvest the vineyard from which this wine comes.
Drink, this is his wine.’
The men ate and drank, and some dipped their bread into the wine.”¹
 Ignazio Silone, *Bread and Wine* (1936)

This passage is not introduced here as a literary ornament, but as an ethnographic and conceptual threshold.

Silone’s words articulate a vision of labour as radically shared: bread and wine emerge not from individual authorship, but from a dense web of human, vegetal, and more-than-human collaborations. The gesture of attributing food and drink to an unnamed “he” unsettles the idea of solitary production and anticipates a relational understanding of work, value, and responsibility.

In this sense, the quotation opens the analytical horizon of the article, foregrounding fermentation and viticulture as collective processes in which invisible forms of labour – such as that of yeasts – are already implicitly at work.

Introduction: Beyond Human Heroism

The Susa Valley, in Western Piedmont, offers a privileged field for observing how wine emerges from the entanglement of relationships among people, environments, and non-human beings. Here, the vine grows in balance on steep slopes, among stone terraces and shifting microclimates, and wine production requires slow gestures, patience, and collaboration.

While the notion of “heroic viticulture” is locally used to describe the physical hardship of mountain winegrowing, I propose to reinterpret it analytically as an invitation to move beyond the centrality of human heroism. From an anthropological perspective, heroism here does not reside solely in human endurance, but emerges from a constellation of shared labours involving vines, soils, climatic forces, and microbial life. The expression “heroic viticulture” operates across multiple semantic and practical registers, which do not always coincide. At an institutional level, it functions as a normative category, defined

¹ Original quotation in Italian from *Vino e pane* (1936). Translation by the author.

through measurable criteria such as slope gradient, altitude, and terracing, and mobilised in policy frameworks aimed at protecting marginal agricultural landscapes. At a discursive level, the term circulates in promotional materials, media narratives, and collective initiatives as a powerful label that conveys values of effort, resilience, and territorial authenticity. Ethnographic engagement, however, reveals a more ambivalent relationship to the notion at the level of everyday practice.

While some producers strategically adopt the language of “heroism” in contexts of communication and valorisation, many do not explicitly describe their work as heroic. Instead, they speak of necessity, habit, attachment to the land, or simple continuity with past practices. In this sense, “heroic viticulture” emerges less as a stable self-attribution than as a category that is negotiated, selectively mobilised, or even bracketed in daily labour. This distinction allows the article to approach heroic viticulture not as a fixed identity, but as a semiotic field in which institutional norms, public narratives, and situated practices intersect – sometimes reinforcing one another, sometimes diverging. It is within these dissonances that the analytical shift proposed here takes place: from heroism as an individual attribute to viticulture as a collective and more-than-human accomplishment.

Within this semiotic field, the viticultural landscape of the Susa Valley can be read as a constellation of more-than-human relations: a system of metabolic, affective, and technical exchanges in which different forms of life participate in constructing taste, quality, and territorial memory. Each harvest renews a fragile equilibrium between natural and cultural elements, between seasons and hands, between microbial invisibility and agricultural gestures.

This article is informed by, yet not fully aligned with, the so-called ontological turn in anthropology. Rather than adopting an ontological framework as a doctrinal position, the analysis draws on its core intuition: that worlds are not merely interpreted differently by social actors, but are actively enacted through relations, practices, and material engagements. This perspective is particularly suited to the study of viticulture and fermentation, where agency, temporality, and causality are distributed across heterogeneous beings and processes. Here, the ontological turn is mobilised as an analytical sensibility rather than as a theoretical endpoint – a way to take seriously more-than-human forms of coexistence without presuming a radical break from other anthropological traditions. In this article, I propose analytically to approach yeasts not merely as technical elements of fermentation, but as participants in the processes through which the valley’s wines take form. This perspective does not necessarily reflect an explicit emic theory articulated by vine growers themselves – who have only recently begun to attend to yeasts as actors in fermentation – but rather emerg-

es from ethnographic observation, dialogue with oenologists, and engagement with multispecies theory. From an analytical perspective, to look *beyond human heroism* thus means to read viticulture not solely as an agricultural or economic activity, but as an ontological practice of cohabitation, in which life – human and microbial – intertwines in a continuous process of transformation and mutual attunement.

Fermentation could also be interpreted through a critical lens as a form of human exploitation of non-human labour, in which microbial activity is harnessed, managed, and instrumentalised to produce economic value. From this perspective, yeasts appear as a biological workforce whose metabolic capacities are extracted, optimised, and stabilised through technical intervention, echoing broader critiques developed within political ecology and science and technology studies.

However, ethnographic observation of spontaneous and mixed fermentations in the Susa Valley complicates a purely extractive reading of microbial labour. In these contexts, human control over fermentation remains partial, fragile, and constantly exposed to uncertainty. Producers repeatedly emphasise waiting, attentiveness, and restraint rather than mastery, and technical intervention is often described as a form of accompaniment rather than command.

For this reason, I propose to approach fermentation not primarily as a relation of domination or extraction, but as a situated form of collaboration and interdependence. Yeasts are neither autonomous agents nor passive resources: they act within constrained environments shaped by human decisions, while simultaneously exceeding human prediction and control. Collaboration, in this sense, does not imply symmetry or harmony, but names a relational condition marked by negotiation, vulnerability, and mutual exposure.

This relational configuration becomes particularly visible in practices such as spontaneous fermentation and co-inoculation, in which producers deliberately accept a degree of microbial autonomy while remaining responsible for the outcome. Fermentation emerges as a space of more-than-human diplomacy, in which collaboration is continuously tested rather than assumed.

This analysis develops in dialogue with Arceño's work on multispecies alliances in winemaking (Acerno 2021), which explores how human–microbial relations are configured within established wine economies in contexts such as Ohio and Alsace. Arceño's contribution is crucial in showing how fermentation emerges as a site of coordination, control, and cooperation between humans and yeasts within relatively stable technical and institutional frameworks.

The case of the Susa Valley, however, foregrounds a different configuration of multispecies alliance. Here, winemaking unfolds within a marginal and fragile viticultural context, characterised by steep terrain, limited mechanisation,

regulatory constraints, and economic vulnerability. In this setting, collaboration with yeasts is not primarily oriented toward optimisation or consistency, but toward persistence, care, and adaptation under conditions of uncertainty. Rather than stabilising fermentation through standardised infrastructures, producers often negotiate microbial activity through waiting, restraint, and selective intervention.

This comparison highlights how multispecies alliances in winemaking are not uniform, but are shaped by territorial conditions, regimes of regulation, and degrees of marginality. While Arceño's work illuminates fermentation within consolidated wine worlds, the Susa Valley reveals how more-than-human collaboration takes on a distinct ethical and political valence when it becomes a matter of sustaining life and labour in precarious landscapes.

This article also resonates with broader anthropological and interdisciplinary debates on value, materiality, labour, and the governance of life. While not engaging these literatures systematically, the article draws selectively and implicitly on classic and contemporary contributions as conceptual resources rather than as direct objects of engagement. These works concern food and value, critical historiographies and ontopolitical readings of material practices, Anthropocene temporalities, and more-than-human approaches to labour, environment, and vitality (Mintz 1985; Chartier 2021; Chakrabarty 2009; Povinelli 2016; Krzywoszynska 2020; Fair, McMullen 2023).

Theoretical Framework: Non-Human Labour and Zymurpolitics

If heroic viticulture renders visible the shared labour between people, vines, and landscape, fermentation brings this cooperation to an even more intimate and contested level, where questions of agency, labour, and governance are condensed within microbial life. In the depths of the cellar, the relations that animate the territory condense into a living substance: must in transformation. Here, manual effort intertwines with the invisible activity of yeasts, and wine production becomes a site of encounter between human work and microbial work, between technical gesture and vital transformation. It is within this intermediate space – where the scent of must mingles with the silence of the vaults – that the analytical focus of this article takes shape: an ethnographic reflection on the metabolic, sensory, and relational alliances through which wine comes into being.

The anthropology of the more-than-human (Haraway 2007; Tsing 2012) invites us to conceive of production not as an exclusively human gesture, but as the outcome of alliances and cooperations among species. In the context

of heroic viticulture in the Susa Valley, this cooperation takes shape through yeasts, whose metabolic activity unfolds alongside winemaking practices, shaping taste, temporalities, and forms of memory under conditions of material constraint and regulatory pressure.

As Barua (2018) writes, non-human labour is both metabolic and affective: it acts within matter and simultaneously within relationships. From this perspective, Furness (2022; 2023) proposes the notion of *zymurpolitics* – a politics of fermentation that acknowledges the vital and relational dimensions of fermentative processes.

Fermenting is not merely a technical action, but a way of living together, of negotiating balance and autonomy between humans and yeasts. The cellar thus becomes a site of cohabitation, where care, waiting, and attentiveness are transformed into ethical acts, understood as situated forms of listening and shared governance of living processes (Despret, Meuret 2016). Within this theoretical framework, the research sought to explore how such interspecies alliances take shape within the concrete practice of winemaking. Observing the work of yeasts meant entering an environment where more-than-human labour is not just a concept, but a lived reality – an interweaving of gestures, smells, temporalities, and relations that becomes knowledge.

Methodology: Doing Research with Yeasts

This study is based on a multi-sited ethnographic approach aimed at exploring the practices and narratives emerging within the winemaking contexts of the Susa Valley (Western Piedmont, Italy). Fieldwork began in June 2025 and developed through an initial phase of approximately six months, encompassing key moments of the viticultural and oenological cycle, including vineyard work, the 2024 harvest, and cellar-based fermentation. Following this initial phase, fieldwork was temporarily suspended and subsequently resumed, allowing for continued ethnographic engagement beyond the submission of the manuscript in November 2025. While this article draws primarily on material collected during the initial phase of research, the broader ethnographic project remains ongoing. The research focuses on how humans and non-humans co-inhabit a shared workspace beyond purely technical practices.

The research involved approximately ten main interlocutors, primarily vine growers, alongside one oenologist and several sommeliers, whose perspectives contributed to the analysis of taste, quality, and wine valuation. Additional secondary interlocutors were encountered during fieldwork. These interlocutors

differed in age, professional background, and degree of engagement with spontaneous or guided fermentations. Access to the field was facilitated through repeated visits to vineyards and cellars and through the gradual construction of trust and familiarity with local producers and institutional actors. Although the core ethnographic fieldwork for this article was conducted in the Susa Valley, the research is informed by a broader, long-term engagement with winemaking contexts across different regions. Over the years, I have visited wineries in Piedmont (including the Langhe and Barolo area), Tuscany, Sardinia, Burgundy and Provence, observing diverse fermentation practices, regulatory regimes, and technical cultures.

Rather than constituting a systematic comparative study, this extended circulation provided a situated background against which the specificity of the Susa Valley could be analytically grasped. The multi-sited character of the research thus lies both in the movement between different cellars and vineyards within the valley and in the relational positioning of this field within a wider ecology of winemaking practices. These sites include not only physical locations, but also institutional, regulatory, and ritual settings – such as the Consortium, public wine events, and local festivities – through which winemaking practices are negotiated and made visible.

Fieldwork involved participant observation in cellars and vineyards at different stages of the production cycle, with particular attention to spontaneous fermentations and co-inoculation processes. These practices made it possible to observe how producers balance the freedom of indigenous yeasts with the pursuit of oenological safety and regularity. Spontaneous fermentations – entrusted to the cellar's microbiome and the natural populations of the must – render perceptible a more autonomous dimension of microbial labour; co-inoculations, by contrast, operate as a form of technical diplomacy in which selected and indigenous yeasts coexist, collaborate, or compete. Following both practices made it possible to analyse the ongoing negotiation between technical and sensory knowledge, between prediction and surprise, which constitutes a central dimension of the wine's ontopolitics.

During this phase of research, my role was primarily that of an observer rather than an active participant in winemaking operations. However, this observational stance was informed by an embodied familiarity with viticultural and cellar practices, acquired through long-term family experience. Wine was traditionally made in my family, and I participated for many years in manual harvest and cellar work.

This background shaped my mode of observation: rather than focusing on learning techniques, attention could be directed toward rhythms, gestures, and moments of uncertainty in fermentation. Observing-and-making wine thus

differed from simply making wine, insofar as the presence in the cellar was oriented toward relational dynamics and more-than-human interactions rather than toward production outcomes.

Semi-structured interviews and informal conversations were also conducted with producers, oenologists, and agronomists in the valley, exploring topics such as the memory of spontaneous fermentations, the role of DOC regulations, experimentation, and perceptions of quality. The words of the winemakers were treated not as sources of information, but as performative acts: each narrative reformulates the relationship with wine and with yeasts, constructing its own ontology of labour.

In parallel, the research included a qualitative analysis of technical practices, based on direct observation and photographic documentation, integrated with a critical review of anthropological, oenological, and microbiological literature. This triangulation of perspectives made it possible to follow fermentation as a relational process articulated across multiple levels – material, sensory, symbolic, and political.

These reflections emerged directly from prolonged observation of fermentation processes and from repeated moments of waiting, hesitation, and adjustment shared with producers during cellar work. From an epistemological standpoint, the research aligns with an *anthropology of care* understood as a situated practice of attention and responsibility toward living processes (Despret, Meuret 2016). Doing research with yeasts means accepting a non-human temporality: learning to linger, to wait, to listen to the rhythm of another life. Spontaneous fermentations, with their unpredictability, impose a *methodology of uncertainty*, in which the unforeseen is not an error but a source of knowledge. The reference to a methodology of uncertainty situates this research within a broader anthropological tradition that treats uncertainty not as a lack of knowledge to be eliminated, but as a constitutive condition of social and epistemic life. Scholars such as Samimian-Darash and Rabinow (2015) have shown how uncertainty operates as a productive and anticipatory force within regimes of knowledge and governance, while anthropologists including Mary Douglas (1972) and João Biehl (2013) have explored how indeterminacy is lived, inhabited, and negotiated in everyday practices.

In dialogue with this literature, the case of fermentation in the Susa Valley allows uncertainty to be approached not primarily as a condition of crisis or risk, but as an ordinary and generative feature of productive life. Spontaneous fermentation requires winemakers to engage with indeterminacy as a mode of collaboration rather than as a problem to be solved, transforming waiting, attentiveness, and restraint into practical forms of knowledge. In this sense, the methodology of uncertainty developed here does not seek to manage or reduce

unpredictability, but to learn from it, treating uncertainty as a shared temporal condition that structures relations between humans, yeasts, and environments. In this sense, multispecies ethnography does not simply consist of adding yeasts among social actors, but of recognising that all knowledge arises from doing-together. Yeasts, winemakers, temperature, and the stone and wood of the cellar participate in the emergence of a world that takes form through the course of research. Observation is never neutral: it is part of the same ecology it seeks to describe.

During the research, attention was also paid to mediating devices as sites where the relationship between control and spontaneity is negotiated. Regulations, oenological protocols, and DOC standards were analysed not as mere technical constraints but as ontopolitical regimes defining what can and cannot be considered “good wine.”

From this perspective, the methodology adopts a lens inspired by the concept of *more-than-human labour* (Barua 2018; Mouret, Lainé 2023). Studying fermentation means recognising that labour does not belong exclusively to the human sphere: it is a metabolic, affective, and collective process in which yeasts perform material and symbolic transformations. Their *doing* generates value – taste, identity, memory – but also relationships, since every fermentation involves cooperation, conflict, and diplomacy among species.

Finally, the methodological approach integrated moments of reflective and autoethnographic writing. My position, in this context, was that of a *partial witness* (Haraway 1988): aware of my situated presence, yet also of the need to allow myself to be transformed by the encounter. Ethnography with yeasts required a rethinking of the very concept of the field: no longer a physical place to explore, but a fermenting environment in which knowledge is produced through contamination and coexistence.

In summary, this methodology sought to make research itself an act of epistemic coexistence – a way to interrogate winemaking as a form of relationship, of memory, and of a shared future between humans and non-humans.

This methodological approach calls for an explicit clarification of the relationship between ethnographic voices and analytical interpretation.

Throughout the article, a distinction is maintained between emic conceptions articulated by producers and the analytical framework developed by the author. While vine growers in the Susa Valley have only recently begun to explicitly reflect on yeasts – often delegating such concerns to oenologists – the analytical attention to microbial processes in fermentation represents a theoretical proposition informed by ethnographic encounters, situated observations, and multispecies scholarship. Rather than attributing this perspective directly to local actors, the article explores how their practices, silences, and selective attentions make space for such an interpretation.

Heroic Landscapes and Geographies of Wine

The historical reconstructions presented in this article draw on a combination of oral memories collected during fieldwork, local narratives, and existing historical and ethnographic literature; where possible, these sources are explicitly distinguished.

When summer recedes and the days grow shorter, the vine growers of the Susa Valley begin the harvest. It is an ancient gesture that renews a millennia-old relationship between humans and the vine. The origins of this beverage, which has always accompanied moments of celebration, go back to pre-Roman times: historical reconstructions suggest that viticulture in the Susa Valley developed along the Via Francigena, a route of trade and pilgrimage linking Italy to neighbouring France. Inns and taverns scattered along the way offered travellers rest and refreshment with flasks and litres of local wine – expressions of a social and sensory landscape in which hospitality was an integral part of local culture.

According to local accounts and oral memories shared during fieldwork, small producers would keep for themselves the lesser-quality wine, obtained from the grape pomace and the remaining juice after pressing the finest clusters – the so-called *torchum du bun* – or drink *piketto*, made by adding water to the leftover marc. This economy of reuse and frugality, typical of mountain peasant societies, expressed a logic of care and non-waste: every part of the vine, every residue, was material for life and exchange.

After the Second World War, urbanisation and industrialisation led to the abandonment of fields and the near-total disappearance of mountain crops. In recent decades, however, a group of vine growers from the Susa Valley has revived the local wine-growing heritage, bringing back to light rare and almost forgotten grape varieties. The valley's pedoclimatic conditions – sheltered from northern winds, well-exposed to sunlight, and ventilated – now allow vines to be cultivated even beyond 850 metres above sea level, in what is proudly described as *heroic viticulture*.

Heroic because it is practised under extreme conditions, on steep slopes and dry-stone terraces; heroic because it requires manual work, effort, and dedication; heroic, finally, because it represents a form of cultural and territorial resistance. To be classified as such, viticulture must meet at least one of the following criteria: a slope exceeding 30%, an altitude over 500 metres, or vineyards planted on terraces and stone walls. Yet beyond these technical parameters, it is "heroic" because it produces a collective effect: it preserves the landscape, safeguards biodiversity, and maintains human presence in marginal areas often threatened by depopulation.

The hardship of mountain viticulture intertwines with the tenacity of the plants themselves, which adapt to harsh environmental conditions. In this context, the vine becomes a figure of co-resistance: it lives in balance with the soil, stabilises the slopes, limits erosion, and contributes to the ecological and symbolic continuity of the territory. Manual cultivation reduces energy impact and supports soil health; green manuring, even at high altitudes, enriches the land with organic matter, fostering biodiversity. The scarcity of resources and the uniqueness of microclimates confer rare, almost unrepeatable sensory qualities upon the wines, making each vintage a document of the landscape.

The recovery of these practices is part of a broader movement, recognised internationally: as recalled by the *Associazione Nazionale Città del Vino* (2022), heroic viticulture represents a “sentinel of biodiversity and landscape preservation.” In the 1980s, the vineyard became an integral part of the landscape and a bearer of cultural value – a strategic element for territorial quality and local development.

In the Susa Valley, this heroic landscape is manifested in the stone terraces, in plots situated between 700 and 1000 metres above sea level, in the windy microclimates and wide temperature variations that influence grape ripening and microbial metabolism, contributing to the definition of a unique oenological profile. In some high-altitude areas of the valley, these environmental conditions have also allowed the survival of rare vines planted on their own roots (*piède franco*). Unlike most European vineyards, which were grafted onto American rootstocks following the phylloxera epidemic that devastated *Vitis vinifera* in the late nineteenth century, these vines were spared due to altitude and climatic constraints that limit the parasite’s survival. The presence of *piède franco* vines is locally perceived as a sign of continuity with pre-phylloxera viticulture and reinforces the representation of the Susa Valley as a marginal yet resilient wine-growing landscape.

The native grape varieties – *Avanà*, *Becuet*, and *Baratuciat* – recount, through their aromatic and genetic differences, the valley’s cultural plurality. The Valsusa DOC Consortium now works to promote this identity, enhancing quality and typicity through collaborative networks among producers, researchers, and institutions.

The contemporary revival of viticulture in the Susa Valley is often described as a “renaissance.” Ethnographic accounts, however, reveal how this revival is marked by structural fragilities and uneven conditions, rather than by linear growth or institutional support.

As one producer explained, the main obstacle to the renewal of viticulture is not lack of interest, but the material and political conditions required to make

investment possible. “People talk about starting again”, he said, “but few realise what it actually costs. You need land, equipment, time – and there is very little public support to make that feasible.”

He recounted the case of a young grower who had recently gained access to a series of plots, some of which fall within the boundaries of a protected park. While he had already prepared grafted vines in a greenhouse, he was unable to plant them: park regulations prohibit fencing, yet without fencing the vines would be destroyed by wild animals. In this sense, the “renaissance” of viticulture in the Susa Valley appears less as a return than as a fragile and contested process, shaped by regulatory constraints, uneven access to land, and the absence of sustained political support for mountain agriculture.

These difficulties unfold within a territory deeply shaped by large-scale infrastructural projects, most notably the high-speed railway (TAV). Beyond its symbolic and political visibility, the project has had direct material effects on viticulture in the Susa Valley: vineyards have been expropriated, agricultural plots fragmented, and access to cultivated land restricted.

In some cases, producers are required to enter militarised construction areas in order to reach their vineyards, negotiating daily with regimes of surveillance, soil consumption, and infrastructural disruption. Under these conditions, viticulture becomes an act of persistence within a landscape where agricultural continuity is repeatedly interrupted by projects of territorial transformation.

Within this scenario, wine continues to represent a *total social fact*: an expression of labour, memory, and the relationship between humans and their environment. Each bottle contains a fragment of landscape, a form of knowledge, and a gesture of resistance. As in the rituals of the past, today too the care of the vine and the fermentation of wine embody a way of dwelling in the world – of building relationships and safeguarding the life that renews itself through time.

Wine Rituals and Cycles of Rebirth

As documented in historical and ethnographic studies of Alpine religious traditions (Giai 2011), wine assumed a sacred dimension on specific ritual occasions, such as during the *sacre rappresentazioni* or *mystères* – religious plays widely performed since the Middle Ages in the Alpine lands between Savoy and the Dauphiné – forming a vast heritage of folk and cultural traditions. In past centuries, the *mystères* were staged by mountain communities at the end of the long and harsh Alpine winter, usually during the feast of Pentecost. They combined the Christian celebration (the life and martyrdom of a saint, or the Passion of Christ) with the pagan rituals of spring agricultural festivities and the first harvest.

During these occasions, the *holy Pentecostal bread* was distributed – small round loaves symbolically recalling the breasts of Saint Agatha, virgin and martyr – celebrating fertility and the rebirth of the earth. The religious spectacle, lasting two or three days, was accompanied by music, food, and drink, imbued with ancient symbolic meanings tied to the cult of trees, the May festivals, sword dances, and propitiatory rituals for the harvest. The *sacre rappresentazioni* often contained references to wine – *clairet*, *muscat*, *hippocras* – probably wines produced in the valley itself (Giai 2011).

These practices were embedded in communities that survived through agriculture in harsh, inhospitable environments, marking the agricultural year through cyclical rituals of fertility and rebirth – marking the agricultural year through cyclical rituals of fertility and rebirth, often narrated and remembered as forms of continuity across generations. In such a socio-economic context, wine was not, as is often assumed, a mere palliative offered to the dreams of people deprived of other forms of distraction, but a powerful social bond. It was one of the ways through which communities kept their traditions and peasant culture alive.

The collective act of wine drinking – as a moment of friendship and shared celebration – has endured throughout the centuries: from the times when Saint Maximus, Bishop of Turin, railed against the *dianatici*, drunken worshippers of pagan cults in the countryside, to the present day, when good wine still accompanies the rituals of spring festivals and remains an indispensable ally in taming the bear that awakens in February in Urbiano, during one of the most significant Alpine carnivals still alive in Piedmontese folklore.

Even today, on the feast day of Saint Brigid, patron saint of Urbiano, hunters go in search of the bear – impersonated by a local villager – corner him, and drag him in chains through the streets: the bear drinks copiously of the red nectar until, finally tamed, he dances with the most beautiful girl in the village. The dance seals the symbiotic relationship and “domestication” between humans and nature, between the sacred and the profane, between Saint Brigid and the wild power of the mountain.

In these practices, wine appears as a medium of transition and reconciliation – a liminal substance that unites worlds and temporarily suspends boundaries between human and animal, festivity and sacrifice, faith and fertility. Drawing on long-term ethnographic research in the Western Alpine area, these ritual configurations can be read as expressions of an *animated nature*, in which wine functions not merely as a symbol, but as an active mediator within a relational ecology involving humans, animals, saints, and landscape (Agus 2015; 2018; 2023; Zola *et al.* 2022). During fieldwork, the circulation and consumption of wine during the feast emerged not as a symbolic residue of the past, but as a taken-for-granted gesture embedded in collective participation, conviviality,

and bodily engagement, reaffirming wine's role as a mediator in lived social relations rather than as a heritage marker explicitly framed as "tradition."

As in the festivals, so too in the cellar does wine remain a site of transformation and encounter. Fermentation can be approached analytically as a rite of passage, insofar as it marks a transition between states and requires forms of collective attention, waiting, and care. This is not to suggest that winemakers explicitly conceptualise fermentation in ritual terms, but rather that this analytical lens helps make visible forms of collective attention, waiting, and care that structure fermentative practice. In this sense, the cellar may be read as a ritual stage, not in a literal sense, but as a space where transformation is collectively anticipated, monitored, and interpreted.

The Work of Yeasts in the Fermentation of the Must

Alcoholic fermentation is the invisible heart of winemaking – a process through which yeasts transform the sugars in the must into ethyl alcohol, heat, and carbon dioxide, while simultaneously generating aromatic compounds and sensory textures that give body and voice to the wine.

Leading this transformation are primarily *Saccharomyces cerevisiae*, fermentative yeasts that take over after an initial phase dominated by apiculate and oxidative strains – more ephemeral and sensitive to alcohol.

Taken together, these microbial populations compose a dynamic sequence: a community in motion that temporarily inhabits the must and transforms it, leaving in it biochemical and olfactory traces of its presence. Fermentation thus becomes an invisible choreography of births, alliances, and substitutions, where matter becomes relation and wine begins to take shape.

In oenology, a distinction is made between "indigenous" yeasts, naturally present in the vineyard and the cellar, and "selected" yeasts, cultivated and multiplied in laboratories to ensure regular and predictable fermentations. The former, slower and less stable, carry the microbial memory of place and the imprint of the *terroir*; the latter guarantee safety and reproducibility but tend to reduce biological diversity and territorial specificity.

Winemakers in the Susa Valley often experiment with intermediate forms – such as co-inoculations and co-fermentations – that can be understood analytically as forms of technical diplomacy between control and spontaneity. Yeasts participate in shaping the aromatic profile of the wine, a role that this article interprets as a form of more-than-human labour. Their work is at once metabolic and creative: a mediation between sugary matter and the culture of taste, between microbial life and territorial identity.



Cellar Memory and Care

Local producers and oenologists describe the cellar as a living organism endowed with its own microbiome – a porous space that holds stratified microbial memories and requires constant gestures of care. The walls, vats, and barrels retain traces of past fermentations, of seasons and hands that have inhabited that place. Contemporary hygienic practices, such as the sanitisation measures required by HACCP regulations, have improved oenological safety but can also reduce biodiversity and weaken the biological “memory” of the site.

Within this context lies an ethical and sensory choice: to accompany spontaneous fermentation, entrusting the process to the indigenous yeasts of the cellar, or to inoculate selected strains to guarantee predictability and stability. According to the recollections of local producers and oenologists, until the mid-1990s the Susa Valley relied almost exclusively on spontaneous fermentations: wine was born from the microbes dwelling on grape skins and within the working environments, in a dialogue of trust with time and matter. The introduction of industrial yeasts, beginning in that period, improved the safety and regularity of the process, but sometimes at the cost of part of the wine’s aromatic and sensory complexity.

Today, many producers seek a balance between these two poles, practising forms of co-fermentation and mixed inoculation that restore to the cellar its relational dimension: a space where control and spontaneity, technique and memory, and an ethics of care are held together through microbial activity that continues largely beyond human attention.

In recent decades, wooden vats and barrels, traditionally used for vinification, have often been replaced by stainless steel tanks or new-generation composite materials. Whereas wood was porous and alive, capable of hosting a stable microbiome and retaining the aromas of previous vintages, steel ensures greater hygiene and thermal control but also a certain sensory neutrality.

Many winemakers describe this transition as a tactile and affective turning point: the gestures, sounds, and smells of the cellar have changed. Wood “breathed”, while steel “protects but remains silent.”

In the passage from the organic to the metallic, the cellar transforms into a laboratory where technical precision coexists with nostalgia for contact – a place where the memory of wood survives in the stories told, in the small vats still in use, and in experimental micro-fermentations.

Waiting, in the cellar, is a form of invisible labour. In the early hours of morning, when the vapour of the must rises in thin filaments, the air changes colour – dense, golden, vibrant. One hears the faint sound of bubbles multiplying, the step of the winemaker gently scraping the floor, the metallic clink of tools rest-



ing against the wall. Everything else is suspension: fermentation time does not obey the clock, but an internal rhythm that only the yeasts know.

It is within this same logic of interdependence that the experience of the *Consorzio di Tutela e Valorizzazione dei Vini DOC Valsusa* takes root, where collaboration among winemakers, institutions, and researchers continues the invisible work of fermentation, translating microbial trust into a collective project of Alpine renewal.

The Consortium and the Winemaking Revival of the Susa Valley

The *Denominazione di Origine Controllata* (DOC) Valsusa was established by ministerial decree on 31 October 1997 (published in the *Gazzetta Ufficiale* No. 265 of 13 November of the same year) and reserves the DOC designation for red wines made from Avanà, Barbera, Dolcetto, and Neretta Cuneese grapes (alone or together) for at least 60%, and for the remaining 40% from other recommended and authorised varieties of the Province of Turin. Since 2004, the production regulations have also included Becuèt, another important local grape whose valorisation has helped define the contemporary identity of wine production in the Susa Valley.

In 1999, the *Consorzio di Tutela e Valorizzazione dei Vini DOC Valsusa* was founded, based at the *Comunità Montana Bassa Valle Susa e Val Cenischia* in Bussoleno. Today, the Consortium, chaired by Giancarlo Martina, brings together twelve wineries that cover almost the entire area registered under the DOC designation – about ten hectares distributed across nineteen municipalities, from Almese to Exilles.

For over twenty-five years, the Consortium has promoted the protection and enhancement of a wine-growing sector as fragile as it is significant: just over twenty hectares of vineyards, laid out on steep slopes and dry-stone terraces. Its goal is twofold: on one hand, to ensure the continuity of Alpine viticulture, and on the other, to make the valley's oenological distinctiveness recognisable within the broader Piedmontese landscape.

DOC Valsusa wines derive from three main native varieties – the red *Avanà* and *Becuèt* and the white *Baratuciàt* – which testify to the valley's long oenological history, when it once exported wine to Savoy, the Dauphiné, and Turin. After a long period of abandonment, production is experiencing new vitality: *Becuèt* is now vinified in purity; *Avanà* is transformed into classic-method rosé sparkling wine; and late-harvest *Becuèt* grapes give rise to the evocative *Vino del Ghiaccio* (Ice Wine), produced between Chiomonte and Exilles. *Baratuciàt*, rediscovered by Giorgio Falca in Almese, is now cultivated throughout the valley, both as still and sparkling wine.

Alongside the Consortium's work, new independent initiatives – such as that of Giuliano Bosio, former mayor of Almesè and winemaker – have given decisive impetus to the rediscovery and dissemination of *Baratuciàt*. Bosio has recovered ancient mountain vineyards, experimenting with spontaneous fermentations and sustainable agronomic practices, helping to make the variety known beyond regional borders. His activity, together with that of other small, non-affiliated producers, represents a form of oenological resistance: a way of preserving biodiversity and peasant memory through daily gestures of care and an intimate alliance with yeasts and with the mountain.

Thanks to high altitudes, strong temperature variations, and mineral soils, the wines of the Susa Valley are distinguished by freshness, elegance, and aromatic complexity, with a reduced need for chemical treatments. The Consortium is working to expand the vineyard area (which in the early twentieth century covered hundreds of hectares) and to strengthen collaboration between producers, local authorities, and universities.

It is important to note that the winemakers of the Susa Valley are not external to the DOC framework, nor do they position themselves in opposition to it. On the contrary, the Consortium itself was founded precisely in order to obtain DOC recognition, which is widely perceived as a necessary condition for economic survival, territorial visibility, and institutional legitimacy. At the same time, the DOC framework introduces logics of standardisation, predictability, and conformity that do not always align with local practices and aspirations. While regulations do not explicitly impose the use of selected yeasts, they implicitly privilege stable sensory profiles and reproducible outcomes. This creates a normative horizon in which spontaneous and indigenous fermentations appear as risky or marginal. Within this tension, winemakers navigate DOC constraints pragmatically rather than ideologically. Practices such as co-inoculation, selective use of indigenous yeasts, or the confinement of spontaneous fermentations to specific batches allow producers to remain within the DOC system while partially resisting its standardising effects. Resistance here does not take the form of refusal, but of situated negotiation: an effort to preserve microbial diversity and territorial specificity without abandoning the institutional framework that makes wine production viable. Alongside institutional certification regimes such as the DOC, producers in the Susa Valley also rely on informal and relational mechanisms of quality recognition. Although no formal system of participatory guarantee is currently in place, trust-based relationships with consumers, sommeliers, and local networks function as alternative forms of validation. These informal regimes of recognition are also sustained through cultural and editorial initiatives aimed at making mountain viticulture publicly visible. An example is the volume *Valsusa. Emozioni da bere* (Il Graffio, 2022), published in connection with exhibitions,



tastings, and public events involving local producers and the DOC Consortium. Rather than serving as an empirical source, such initiatives function as dispositifs of territorial valorisation, contributing to the circulation of narratives of mountain viticulture, biodiversity, and renewal. Quality, in this sense, emerges less as a standardised attribute than as a negotiated and situated process, grounded in proximity, reputation, and repeated encounters. These informal regimes of recognition resonate with broader efforts to reclaim control over production, circulation, and value – efforts that are inseparable from the material and political conditions of viticulture in the valley.

In this sense, the winemaking revival of the Susa Valley appears as a collective project of Alpine resilience, where the vine becomes an agent of territorial, social, and cultural regeneration. Through this shared labour, the valley rediscovers in viticulture not only an economy, but a way of inhabiting the landscape, restoring value to memory, and building possible futures together. This revival is not merely a productive fact but a lived experience – composed of daily gestures, peasant memories, and new forms of cooperation with the land and its yeasts. The voices of the producers who animate the valley all tell, in different ways, of the same ethical tension: to restore meaning and vitality to a border landscape through viticulture.

Voices of the Valley: Ethical Microcosms and Practices of Resistance

In the Susa Valley, viticulture takes on multiple forms, yet all are united by a shared principle of resistance: the will to restore meaning, voice, and vitality to a marginal landscape. The stories of the producers I encountered show how wine becomes a moral and sensory language – a way of world-making through gestures of care, attentiveness, and cohabitation. In this perspective, vineyards and cellars appear as ethical microcosms, places where the relationship with the land and with yeasts is translated into a practical and affective knowledge.

This research focuses particularly on those contexts that adopt spontaneous fermentations or co-fermentations – practices in which the presence of indigenous yeasts is recognised as a constitutive part of both landscape and sensory quality. In these cellars, agricultural action emerges as a form of embodied knowledge: a “technology of the living” combining scientific know-how with bodily intuitions, discipline with sensitivity. Viticulture, in this sense, is not merely an economic practice, but a *practice of worlding*: an art of maintenance that intertwines human labour with the breathing of soils, the climate, the seasons, the memory of gestures, and the invisible presence of yeasts.

These ethical microcosms are not only enacted in vineyards and cellars, but also in the ways wine is made visible, recognised, and valued within the territory. As one long-standing producer deeply engaged in the collective life of the valley recounted, the challenge of valorising Valsusine wines is not only external but also internal to the territory itself. When asked about the possibility of promoting local wines through events organised outside the Susa Valley, he explained his reluctance: “I think it’s more important to start here, in the valley. Many people who live here don’t even know these wines exist. How can we talk about exporting them if they are invisible at home?”. He recalled how, when he first began producing wine, he personally approached local restaurants, asking them to include Valsusine wines on their wine lists – ideally at the very beginning. Restaurant owners often replied that there was no demand for such wines. “But how can there be demand”, he said, “if they are never offered?”. In some cases, he described giving bottles away directly to restaurant customers who asked about the wines, not as a commercial strategy but as an act of promotion and recognition. For him, making wine in the Susa Valley meant not only producing a beverage but patiently cultivating a local culture of taste, familiarity, and belonging – starting from within the valley itself.

Such practices of care and resistance take different forms across the valley, from collective initiatives to individual experiments in heroic viticulture.

Granja Farm, founded in 2015 in Chiomonte, defines itself as a form of resistance viticulture: the recovery of steep terraces, animal husbandry, distributed hospitality, and experimentation in collaboration with nature. Born out of the movement opposing the construction of the Turin-Lyon high-speed rail line (TAV), the farm – founded by a collective of young farmers – interprets agricultural work as an ecological and political practice of reclaiming territory. Here, the value of indigenous yeasts intertwines with an ethics of care and multispecies coexistence, in which wine production becomes part of a broader strategy of resistance to damage.

La Chimera, founded by Stefano Turbil and his wife Mariangela Calcagnile near Chiomonte, represents an emblematic example of heroic and organic viticulture. Its historic vineyards, located over 700 metres above sea level, host native varieties such as *Avanà* and *Becuèt*, cultivated without herbicides and vinified with low intervention. The wines’ aromatic profile, intense and complex, is interpreted by Turbil as a direct expression of the Alpine microbiome and as the living memory of the territory.

Interviews with Mattia Longoni, Giancarlo Martina, and Vincenzo Rumiano complete this mosaic of experiences. Longoni, an oenologist who moved to Mompantero after working in Trentino, South Tyrol, and Tuscany, sees wine as a tool for territorial regeneration. He focuses on two native varieties – the

white *Baratuciàt* and the red *Becuèt* (known in Savoy as *Persan*) – alongside Nebbiolo and Riesling, the grape variety to which he feels most connected. For him, regenerating the valley means recovering viticultural memory and engaging in dialogue with older generations: gathering the knowledge and gestures of a peasant *savoir-faire* that risked being lost is a way to restore continuity to a mountain-rooted wine culture. In this act of listening and reconstruction, viticulture becomes for Longoni a practice of caring for memory and territory, where scientific research dialogues with oral wisdom and with the microbial vitality of the landscape.

Giancarlo Martina, together with his wife Serena, runs the *Cantina Martina* in Giaglione, cultivating varieties such as *Bequet*, *Avanà*, and *Malliolo*. He experiments with whole-cluster fermentation on *Avanà* and promotes an ethic of manual and affective labour. For Martina, heroic viticulture is also a tool for storytelling and for revaluing the Alpine landscape: wine contributes to requalifying the territory, underlining the link between production, tourism, and local culture.

Vincenzo Rumiano, also from Giaglione, recalls the figure of his father Mario, one of the first local winemakers to introduce the use of sulphur dioxide, at a time when “sulphite was seen as a demon.” His words evoke a time when fermentation was always spontaneous and technical control minimal – a sensorial and artisanal knowledge transmitted in the silence of the cellars.

Within this web of memories, experiments, and gestures, viticulture in the Susa Valley appears as a constellation of practices of resistance and multispecies cooperation. Oenological labour becomes a vital continuum between past and future – a way of cultivating relationships and regenerating the mountain. This analytical framing builds on multispecies ethnography and theories of more-than-human labour, while remaining attentive to the fact that it exceeds the everyday language used by most producers and constitutes an interpretive move made by the researcher. In fermentation, as in social life, the inhabitants of the Susa Valley experiment with forms of diplomacy between freedom and control, care and autonomy, tradition and innovation. Wine production thus becomes, in the analytical framing proposed here, a political and poetic gesture: a *practice of worlding* that intertwines ethics, ecology, and affect. The voices of the valley form a polyphonic chorus of experiences and resistances, in which the landscape, humans, and yeasts continually negotiate the possibility of remaining, coexisting, and transforming together.

In these experiences, the boundary between artisanal practice and scientific experimentation becomes porous. The care of wine does not end with the winemaker’s daily gesture, but continues in laboratories, in consortia, and in dialogues among microbiologists, oenologists, and producers. The living matter

of fermentation thus becomes a shared field of inquiry, where technique is not opposed to nature but part of the same ecology of knowledge.

It is within this space of interaction – among indigenous yeasts, selected strains, and laboratory practices – that the future of Susa Valley viticulture is being shaped. Decisions about inoculation, fermentation temperatures, new steel tanks, or returns to wooden vats are not merely technical choices: they are political acts defining the relationship between humans and microbes, between safety and freedom, between standardisation and diversity.

Technique, Experimentation, and Microbial Biodiversity

The cellars of the Susa Valley can be understood as sites of experimentation, where technique does not replace life but enters into dialogue with it. Co-inoculations and co-fermentations mark an intermediate path between control and biodiversity, enhancing process stability while preserving the microbial plurality that sustains wine's identity and complexity. Here, scientific knowledge does not stand in opposition to tradition but unfolds as a practice of listening and cooperation with the living.

In fermenting musts dwells an extraordinary biodiversity of yeasts that participate in the process at different frequencies and times. *Saccharomyces cerevisiae*, thanks to its resistance to alcohol, tends to dominate alcoholic fermentation, but the achievement of this predominance is variable and depends on the relationship between *Saccharomyces* populations and the non-*Saccharomyces* yeasts present in the must. The initial phases, more chaotic and unpredictable, involve the intervention of different species that prepare the ground for subsequent transformation.

Oenological research at the turn of the millennium emphasised the growing interest in understanding and managing yeast diversity in winemaking, highlighting how different *Saccharomyces cerevisiae* strains contribute to fermentation outcomes and wine quality (Pretorius 2000). Some strains, in particular, can persist in the same cellar for consecutive years, becoming part of its stable microbiome and contributing to the “style” and territorial recognisability of the wines (Capece *et al.* 2016; Bokulich *et al.* 2016).

A fundamental contribution in this direction comes from the work of Simona Guerrini, Giacomo Buscioni, and Lisa Granchi (*Food Micro Team*, DAGRI, University of Florence, 2019), which demonstrated that some strains of *S. cerevisiae* can persist for more than a decade within the same cellar environment, linking microbial memory to human gestures, materials, and rhythms of work. This research shows how each cellar can be approached as a unique ecosystem – an invisible landscape of microorganisms that co-evolves with people and winemaking practices, contributing to the territorial specificity of wine.



From an anthropological perspective, such persistence can be read as a form of living memory: yeasts behave like invisible archivists, capable of transmitting a specific territorial sensitivity over time. The cellar thus becomes a place of biological and cultural inheritance, where matter also ferments history.

From a contemporary standpoint, the recovery and valorisation of autochthonous strains require networks of collaboration involving oenologists, microbiologists, and anthropologists. The goal is not a nostalgic return to a “pure nature” but the construction of a diplomacy of the living – an art of balance between safety and freedom, between standardisation and biodiversity.

The use of selected indigenous strains – naturally adapted to the cellar environment and capable of positively influencing the wine’s sensory characteristics – can represent a concrete way of reconciling technical quality with territoriality. In this perspective, wine science is not merely a technological knowledge but a field of ethical relations: a practice that recognises the more-than-human labour of yeasts as an integral part of the valley’s culture and memory.

If technique constructs the conditions for coexistence, it is in the time of fermentation that such coexistence takes shape. The life of yeasts imposes on winemakers an ethics of waiting and a pedagogy of listening: learning to read the transformations of matter, to accept its autonomy, and to recognise in the rhythm of wine another way of inhabiting time.

Temporalities, Affects, and Fermentative Landscapes

If technique and biodiversity create the conditions for coexistence, it is in the time of fermentation that such coexistence takes form. Spontaneous fermentation imposes another temporality: allowing the wine itself to tell when it is ready. In the cellar, time is not a linear measure but a rhythm to be listened to, a breath to be followed. This ethics of waiting – often in tension with the accelerated tempos of markets and industrial production – becomes a form of sensitive resistance: learning not to force life, but to collaborate with its own rhythms.

Winemakers in the Susa Valley speak of wine as a being in becoming. Yeasts are perceived as presences with character and mood: some “start quickly”, others “fall asleep” and later “wake up”, while others “remain silent for days, then suddenly burst.” This anthropomorphic language does not trivialise the living, but acknowledges its subjectivity – an affective grammar that allows a relationship with what is not human. As Vinciane Despret (2013) suggests, giving voice to the other is a form of care; in the cellar, this gesture translates into listening to the signs that matter emits – a rustle, a shift in temperature, a changing scent.



Fermentation, from this perspective, is an act of sensory coexistence. The winemaker moves through the cellar like a translator: observing, smelling, touching, adjusting the rhythms of racking, recognising that quality is not born of control but of a relationship of reciprocal adaptation. As Tim Ingold reminds us, craftsmanship is always a “walking with materials”, a following of their movements. Thus, in the vats of the valley, humans learn the language of fermenting wine, participating in a process that is at once biological, ethical, and perceptual.

In the Alpine context, fermentation is also a way of inhabiting the landscape. Altitude, sharp temperature variations, and stony soils influence both microbial and human rhythms, producing a plural temporal landscape – one made of waiting and returning, of silences and vital explosions. Within this entanglement of climate, matter, and memory, fermentation becomes a practice of ecological sensitivity: a way of perceiving the mountain as a living organism and recognising in yeasts its invisible messengers.

In the Susa Valley, therefore, wine production is not merely labour but a form of temporal and affective relationship. In the fermenting vats, time becomes porous – inhabited by humans and microbes that coexist, observe, and transform one another. The slowness of fermentation is not inefficiency but a pedagogy of the living: a mutual learning in which the wine teaches the winemaker to care, to wait, and to trust.

As Barad (2007) suggests, matter is never inert: it acts, responds, and enters into relation. The winemaker’s waiting is therefore not emptiness, but shared time – an intra-action among bodies, substances, and temperatures through which wine takes form. In this sense, fermentation is an exercise in co-temporality: a learning of the other’s rhythm, a way of inhabiting time not as a line but as a weave of durations.

Tsing (2012) invites us to think of multispecies collaborations as forms of entanglement emerging in the interstices of capitalism, where life reinvents itself despite the urgency of productivity. The cellars of the Susa Valley can be read as one such interstice, where practices such as spontaneous fermentation and co-inoculation transform slowness into a form of epistemic and ecological resistance, and microbial difference into a principle of survival.

In this perspective, waiting itself becomes political: suspending intervention, listening to the time of the must, and accepting the unforeseen means resisting the logic of total predictability. Wine thus teaches an ethics of uncertainty, in which knowledge consists not in control but in *being with* – in participating in the becoming of things. Fermentation becomes an ontological laboratory of the more-than-human, where time itself works, ferments, and transforms together with the wine.

The waiting and care of fermentation teach that wine is never born alone: it is the outcome of a fragile and situated collaboration. From this everyday practice of coexistence arise the deepest political questions – who decides what counts as quality, who speaks for nature, who remains invisible in the story of taste. It is within these negotiations that the ontopolitics of yeast takes shape.

Ontopolitics of Yeast

The qualities of wine are never fixed once and for all. They are constructed, debated, and continually renegotiated within an entanglement of material practices, sensory knowledge, and social conventions. As Callon suggests, quality is the result of a process of qualification – a collective operation that defines, through relationships and trials, what is perceived as “good”, “authentic”, or “true”. Demossier, in her studies on French wine culture, similarly reminds us that “quality is a social act” a language of power and belonging.

In the Susa Valley, this language unfolds through a lexicon of trust and collaboration. When producers speak about their wines, they do not merely describe aromas or flavours but recount stories of fermentations, difficult vintages, waiting, and dialogue with yeasts. Sensory quality thus emerges from a work of relation: between the winemaker’s hands, the climate’s conditions, the memory of the cellar, and the invisible trajectories of yeasts in action.

In this context, quality becomes a political act in the Foucauldian sense – a field where diffuse forms of power are exercised and regimes of truth are built. DOC production regulations, for instance, establish analytical parameters, yields, and permitted grape varieties, yet they still fail to recognise the fermentative component as a defining element of territorial identity. While only a limited number of producers explicitly articulate yeasts as an extension of *terroir*, this article explores how certain practices and discourses allow yeasts to be analytically understood as part of the territorial assemblage.

Terroir, once a purely geographical category, thus transforms into a constellation of relations: a more-than-human system that also includes yeasts. They translate into chemistry the temperature of the summer, the stoniness of the soils, the history of dry-stone walls, the humidity of cellar vaults. Following Szymanski’s (2018) proposal in her study of synthetic yeasts, *terroir* may be understood not as an exclusive property of soil or tradition, but as a multispecies and multi-sited relationship – one capable of encompassing technical practices and controlled environments. This perspective shows how laboratory practices can themselves generate forms of territoriality, made of technical, affective, and sensory connections between humans and yeasts. *Terroir* thus becomes a



situated co-figuration of relations rather than a natural property – a field in which technologies also participate in the construction of identity and taste.

In the Susa Valley, this perspective allows both spontaneous fermentations and guided inoculations to be read as expressions of a shared relational landscape, where human practices and microbial dynamics intertwine in shaping quality, meaning, and the wine's memory. It is a composite landscape where different ways of inhabiting the living coexist. Some producers speak of the need to “accompany” fermentation – a grammar of gesture that weaves together technical knowledge and relational sensitivity. In this sense, even standardisation is not merely an act of control but a form of diplomacy between safety and freedom, between prediction and listening. Szymanski invites us to shift our gaze: the question is no longer whether a wine is “natural” or “artificial”, but to interrogate the ontopolitics that make certain practices legitimate, certain relations visible, and others marginal.

Wine quality thus emerges as a collective field of negotiation among regimes of knowledge, technical instruments, and microbial presences – where the “good” is not an objective given but the result of a *sensitive politics* (Foucault 1976; Latour 2005). In the Susa Valley, this politics takes the form of a plurality of practices: a continuous mediation between regulatory norms, desires for authenticity, and alliances with the yeasts that ferment, rest, and awaken. Spontaneous fermentation, with its unpredictable timing, becomes a form of both sensory and political mediation – a way of letting the earth speak, but also of accepting its autonomy.

DOC regulations, which define grape varieties, yields, and analytical parameters, still do not consider fermentation as a key element of territorial identity. Yet many Susa Valley producers regard yeasts as an extension of the *terroir* itself. From this perspective, yeasts do not merely transform must, but participate in shaping taste, shared vocabularies, and criteria of value. The quality of wine, therefore, is a social and multispecies fact – born from the encounter between human sensitivity and biological creativity, between an ethics of care and a science of fermentation.

Recognising yeasts as more-than-human workers does not mean anthropomorphising them, but admitting that wine quality arises from shared labour. In the Alpine landscape of the Susa Valley, *zymurpolitics* thus takes shape in everyday acts of care and collaboration aimed at defending microbial biodiversity and territorial identity. Considering the microbiome as part of *terroir* opens a public discussion on the politics of quality, inviting consortia, producers, and researchers to co-design tools that include the invisible labour of yeasts.

From this standpoint, taste reveals itself as a political terrain where questions of value, recognition, and power intertwine. If fermentation is a practice of

coexistence between humans and yeasts, taste is the language through which this coexistence is translated, judged, and socially shared.

To speak of quality, however, also means to question what, in wine, is perceived as “good.” Behind every sensory judgement lies a worldview – a symbolic order that determines what deserves trust, what counts as pure, what truly belongs to a territory. It is from this dimension of taste that anthropological reflection encounters fermentation.

The Good to Think... and to Ferment

In anthropology, “the good” is never a neutral category. As Lévi-Strauss (1964) reminded us, what is “good to eat” is also “good to think”: taste is a form of social knowledge, a language that orders the world. In wine, the “good” is constructed at the intersection of sensory experiences, cultural norms, and technical regimes: it is the outcome of a collective process of qualification that reflects values, memories, and forms of belonging.

Douglas (1972) showed how classifications of purity and impurity always express a symbolic order; in wine, these categories are now reformulated through discourses of “spontaneity” and “naturalness.” Yet what is considered pure or authentic does not depend on intrinsic properties – it is the product of practices, discourses, and power relations (Foucault 1976).

Within this entanglement, sommeliers too participate in defining the “good.” Through the language of tasting – a lexicon that is both technical and deeply cultural – they translate into words and judgements the invisible work of yeasts, winemakers, and landscapes. As Demossier (2010) observes, the figure of the sommelier acts as a mediator of worlds, rendering the complexity of wine intelligible and contributing to the construction of taste hierarchies. Tasting, in this sense, is a political practice: a way of asserting what counts as quality, what deserves trust, and which sensory relationships are considered legitimate.

In the Piedmontese context, the wines of the Susa Valley occupy a particular position: less known than the region’s great appellations, they sometimes move along the margins of more established circuits. This condition is not merely economic but also symbolic: taste reflects and reproduces hierarchies of attention and value. In some producers’ accounts, one hears the feeling that Valsusine wines “still need to find their own words”, or that “our wine is not yet taken seriously” within the broader language of Piedmontese wine.

This condition, however, is not a sign of fragility but of an alternative sensibility – one that proposes a different way of understanding quality: a quality built through dialogue, proximity, and attention to detail. For this reason, tasting assumes a special value here. Sommeliers who work with Valsusine wines en-



gage with a living, sometimes surprising material that invites them to suspend the usual parameters of evaluation and make room for curiosity and listening. In this sense, tasting becomes a meeting ground between different kinds of knowledge: between the codified languages of oenology and the situated forms of understanding that emerge from mountain terraces and cellars.

In the Susa Valley, the good is not a universal value but a relational experience: a wine is “good” when it speaks of its place, when it preserves the voice of the yeast, when it conveys the memory of the landscape in sensory form. Taste thus becomes a mode of *situated thought* (Haraway 1988): a way of being in the world and making world with others – human and non-human alike. Yeasts, with their invisible vitality, participate in this collective construction of the good, translating landscape into flavour and memory into aroma.

From this perspective, taste is not only aesthetic but also ethical and political. As Despret (2013) suggests, thinking with the living means learning to recognise the relationships that make us capable of feeling. The “good” thus emerges as exercise in attention: a way of being in the world and making world with others – humans, yeasts, soils, and climates – who inhabit the valley and sustain its vitality.

If the good is what unites thinking and feeling, then fermentation becomes the place where this encounter takes material form. In the relationship between winemaker and yeast, taste transforms into gesture, and knowledge takes the shape of shared care. It is here that space opens for reflecting on work as a practice of alliance – on fermenting as a way of thinking life itself.

Beyond the Anthropocene: Ethics of Fermentation and Shared Futures

The fermentations of the Susa Valley speak not only of wine, but of a different way of inhabiting the world. In an age marked by haste and extraction, the slowness of fermentation appears as an act of resistance. The work of yeasts – invisible, metabolic, collective – offers a lesson in biological democracy: no hierarchy, no centre of command, only interactions, exchanges, adaptations. Each cell works for itself and for the whole, transforming time into matter and matter into relation.

To think of fermentation as a social and political practice means to shift our gaze: from the producer to the entire ensemble of living beings who take part in the making. It is within this entanglement that the very concept of labour is redefined. As Barua (2018) and Mouret and Lainé (2023) suggest, more-than-human labour is always metabolic: a process of reciprocal transformation

between bodies and environments, between energy and affect. Yeasts do not merely produce alcohol; they generate relational value – reworking residues, recreating balances, giving shape to the very possibility of taste.

From this perspective, the cellar becomes a model of *sympoiesis* (Haraway 2007): a making-with that has neither masters nor fixed boundaries. The winemaker, the yeasts, the air, the stone, and the temperature all collaborate in the production of a common world. Knowledge manifests itself as a diplomacy of the living – an art of mediation among species, techniques, and temporalities, in which care replaces control and sensitivity becomes expertise.

The practices of the Susa Valley show that non-human labour is not an archaic remnant but a possible horizon – a way to rethink sustainability beyond the logic of productivity. In a world that tends to reduce every form of life to a resource, recognising the contribution of yeasts – and with them, of soils, waters, and climates – means imagining shared futures founded not on extraction, but on reciprocity.

To take fermentation seriously as a philosophical gesture also means rethinking responsibility. In every microbial alliance, there is a form of accountability that exceeds the human: a responsibility distributed among gestures, temperatures, and invisible agencies. This calls for an ethics of attention, one that listens to the quiet signals of transformation and accepts uncertainty as part of creation. Such an attitude could inform broader social and ecological practices, suggesting ways of working that privilege responsiveness over domination. In this sense, the ethics of fermentation resonates with feminist and postcolonial critiques of control – offering instead a politics of care, maintenance, and mutual flourishing. What emerges is not a romantic return to nature, but a pragmatic art of composition, where knowledge grows through coexistence rather than competition.

Within this ecology of labour, wine emerges as a relational outcome: matter that responds, memory that is continually renewed, and language through which shared meanings take shape. Fermentation, as Lévi-Strauss once wrote of mythical thought, serves not only to transform nature but to transform those who practise it. And perhaps it is here, in the silent cellars of the Susa Valley – amid the warm breath of the vats and the waiting of the winemakers – that a concrete possibility of a post-Anthropocene world takes shape: a world in which quality is not a measure, but a relationship that keeps fermenting. Perhaps it is in fermentation itself that the simplest and most radical form of thinking together lies hidden.

From here arises the final question: how might yeasts teach us to imagine possible futures – futures fermented through collaboration rather than domination, where the art of making becomes a shared gesture of care and transformation, a quiet revolution still unfolding within and around us.

Conclusions. Fermenting the Relation: Yeasts, Labour, and Possible Futures

In the Susa Valley, wine emerges from a gesture of trust that unfolds through time and matter: a passage from human hands to invisible populations of yeasts, and back again in the form of taste, warmth, and voice. As shown throughout this article, viticulture in this Alpine context is not reducible to a technical process but takes shape as a situated practice of care, in which spontaneous fermentations, co-inoculations, and negotiations with DOC regulations require attentiveness, waiting, and selective intervention. Within these practices, yeasts are not treated as inert tools but as living presences whose activity remains partially unpredictable and whose vitality must be accompanied rather than mastered.

Approaching fermentation through the lens of more-than-human labour (Barua 2018) allows this shared work to be understood as a relational process rather than as the extraction of biological capacities. In the cellars of the Susa Valley, microbial labour unfolds within fragile and marginal conditions – steep terrain, limited mechanisation, regulatory constraints, and economic vulnerability – that shape how winemakers engage with uncertainty. Practices such as spontaneous fermentation and co-inoculation make visible a form of labour that is distributed across species and environments, and that produces not only wine but also relationships, memories, and forms of territorial attachment.

From this perspective, fermentation can be read as an ontopolitical practice: a space in which decisions about control, standardisation, and biodiversity are continuously negotiated. As discussed in relation to DOC frameworks, producers do not oppose institutional regulation outright, but navigate it pragmatically, experimenting with intermediate techniques that allow them to remain within certification regimes while preserving microbial diversity and sensory specificity. Resistance, here, does not take the form of refusal, but of situated adjustment – an effort to sustain life and labour in a marginal landscape without relinquishing institutional visibility.

Thinking with care, as proposed by Despret (2013), helps clarify the ethical dimension of these practices. Attention to yeasts, to rhythms of fermentation, and to signs of transformation does not imply anthropomorphism, but recognises that knowing and producing are inseparable from responsibility toward the living beings involved. In this sense, the work of yeasts and that of humans are not parallel processes but intertwined forms of engagement that sustain both wine and landscape over time. The fermentations of the Susa Valley thus invite a rethinking of labour, value, and production beyond anthropocentric frameworks. When work is shared with other living beings,



it becomes a practice of coexistence and imagination – resisting the homogenisation of taste and knowledge, and opening up possibilities for slower, more relational futures. Wine, in this light, is not simply made: it is accompanied. And to accompany fermentation is to accept uncertainty as a condition of life, restoring dignity to the invisible labour that continues to transform the world, quietly and collectively.

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This work is dedicated to my grandfather, Gaii Giglio, who taught me the value of slow time and of work done with both hands and heart. In his way of listening to the land and caring for it, I recognise the same gesture of the valley's winemakers: a form of knowledge that cannot be measured but is transmitted, like a silent yeast that continues to ferment through time.

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References

Agus, C.A.

- 2015 *Il tempo dell'orso, l'orso nel tempo: l'exemplum dell'arco alpino occidentale*, in E. Comba, D. Ormezzano (a cura di), *Uomini e orsi: morfologia del selvaggio*, Accademia University Press, Torino.
- 2018 *Nourrir la mort pour engendrer la vie: le pain et le vin dans les mystères des vallées alpines entre Savoie et Dauphiné*, in Regione Autonoma della Valle D'Aosta, *Nourrir la mort:*



- rituels funéraires et pratiques alimentaires des Alpes à l'Himalaya*, Regione Autonoma della Valle D'aosta, Aosta.
- 2023 *Cibo e rito. Percorsi simbolici e cerimonie rituali del mondo contadino nelle Alpi Occidentali*, in V. Lari (ed.) *Les pratiques alimentaires en Méditerranée*, Publications de l'Université de Corse A. Piazzola.
- Arceño, M.A.
- 2021 On Winemakers and More-than-Human Workers in the Vineyards of Ohio and Alsace, Culture, Agriculture. *Food and Environment*, 43 (1), pp. 36-46. DOI: <https://doi.org/10.1111/cuag.12266>.
- Barua, M.
- 2018 Animal Work: Metabolic, Ecological, Affective, Theorizing the Contemporary. *Fieldsights*, July 26. <https://culanth.org/fieldsights/animal-work-metabolic-ecological-affective> (consultato il 06/11/2025).
- Beilin, K.O., Suryanarayanan, S.
- 2017 The War between Amaranth and Soy: Interspecies Resistance to Transgenic Soy Agriculture in Argentina. *Environmental Humanities*, 9 (2), pp. 204-229.
- Biehl, J.
- 2013 *Vita: Life in a Zone of Social Abandonment*, University of California Press, Berkeley.
- Bokulich, N.A., Collins, T.S., Masarweh, C., Allen, G., et al.
- 2016 Associations among Wine Grape Microbiome, Metabolome, and Fermentation Behavior Suggest Microbial Contribution to Regional Wine Characteristics. *mBio*, 7 (3), e00631-16. DOI: <https://doi.org/10.1128/mBio.00631-16>.
- Capece, A., Siesto, G., Poeta, C., Pietrafesa, A. et al.
- 2016 Selected Indigenous *Saccharomyces cerevisiae* Strains as a Potential Tool to Preserve Typicity of Apulian Wines. *Annals of Microbiology*, 66 (1), pp. 153-161. DOI: <https://doi.org/10.1007/s13213-015-1094-0>.
- Chakrabarty, D.
- 2000 *Provincializing Europe: Postcolonial Thought and Historical Difference*, Princeton University Press, Princeton.
- Chartier, D.
- 2021 *The Deplantationocene: Listening to Yeasts and Refusing the Plantation Worldview*, in C. Brives, M. Rest, S. Sariola (eds.), *With Microbes*, Mattering Press, Manchester. DOI: <https://doi.org/10.28938/9781912729180>.
- Demossier, M.
- 2010 *Wine Drinking Culture in France: A National Myth or a Modern Passion?*, Bloomsbury, London.



- Despret, V.
2013 *What Would Animals Say If We Asked the Right Questions?*, University of Minnesota Press, Minneapolis.
- Despret, V., Meuret, M.
2016 Cosmoecological Sheep and the Arts of Living on a Damaged Planet. *Environmental Humanities*, 8 (1), pp. 25-36.
- Douglas, M.
1972 *Purity and Danger: An Analysis of Concepts of Pollution and Taboo*, Routledge, London.
- Fair, H., McMullen, M.
2023 Toward a Theory of Nonhuman Species-Being. *Environmental Humanities*, 15 (2), pp. 195-214.
- Fleet, G.H.
2003 Yeast Interactions and Wine Flavour. *International Journal of Food Microbiology*, 86 (1-2), pp. 11-22.
- Foucault, M.
1976 *La volontà di sapere*, Feltrinelli, Milano.
- Furness, W.W.
2022 Making Space for Yeast: Toward a Zymurpolitics. *The Geographical Bulletin*, 63 (3), pp. 39-47.
- Furness, W.W.
2023 *A Politics of Yeast?*, Texas State University, San Marcos.
- Gardner, J.M., et al.
2023 Modern Yeast Development: Finding the Balance between Tradition and Innovation in Contemporary Winemaking. *FEMS Yeast Research*, 23 (3), pp. 1-12.
- Giai, G.
2011 *Le feste religiose nelle Alpi Cozie. Riti, simboli e tradizioni popolari tra sacro e profano*, Edizioni Segusium, Susa.
- Granchi, L., Guerrini, S., Buscioni, G.
2019 Lieviti indigeni di cantina: una fonte di biodiversità per la territorialità dei vini. *VQ – Vite, Vino, Qualità*, 3, pp. 54-59, Università di Firenze – DAGRI / Food Micro Team, Firenze. <https://www.foodmicroteam.it> (consultato il 06/11/2025).
- Haraway, D.J.
2007 *When Species Meet*, University of Minnesota Press, Minneapolis.



Jackson, R.S.

2014 *Wine Science: Principles and Applications* (4^a ed.), Academic Press, San Diego.

Krzywoszynska, A.

2020 Nonhuman Labor and the Making of Resources: Making Soils a Resource through Microbial Labor. *Environmental Humanities*, 12 (1), pp. 227-249.

Latour, B.

2005 *Reassembling the Social: An Introduction to Actor-Network-Theory*, Oxford University Press, Oxford.

Lévi-Strauss, C.

1964 *Le cru et le cuit*, Plon, Paris.

Mintz, S.

1985 *Sweetness and Power: The Place of Sugar in Modern History*, Penguin Books, New York.

Mouret, S., Lainé, N.

2023 Nature(s) at Work: Animal and Environmental Studies and Their Relation with Work, *Revue d'anthropologie des connaissances* 17 (1). <https://doi.org/10.4000/rac.29904>

Povinelli, E.A.

2016 *Geontologies: A Requiem to Late Liberalism*, Duke University Press, Durham.

Pretorius, I.S.

2000 Tailoring Wine Yeast for the New Millennium: Novel Approaches to the Ancient Art of Winemaking. *Yeast*, 16 (8), pp. 675-729.

Samimian-Darash, L., Rabinow, P.

2015 *Modes of Uncertainty: Anthropological Cases*, University of Chicago Press, Chicago.

Silone, I.

2017 *Vino e pane*, Mondadori, Milano (Oscar Moderni).

Szymanski, E.A.

2018 What Is the Terroir of Synthetic Yeast?. *Science, Technology, & Human Values*, 43 (5), pp. 835-859. DOI: <https://doi.org/10.1177/0162243917750929>.

Tsing, A.L.

2012 Unruly Edges: Mushrooms as Companion Species. *Environmental Humanities*, 1, pp. 141-154.

Zola, L., Beggiora, S., Amateis, M., Agus, C.A. (eds.)

2022 *Natura animata. Cerimonie, feste, tradizioni attraverso tempi e culture. Studi in memoria di Enrico Comba*, FrancoAngeli, Milano.

