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HAL Id: hal-02757208

https://hal.inrae.fr/hal-02757208v1

Submitted on 4 Jun 2020

Technique, ecology and culture: the territorial anchorage of Corsican cheese-producers' knowledge

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Abstract: *In light of the heritage setting up as core concern of Localised Agri-Food Systems (LAFS), the know-how encapsulated in agri-food products seems a key issue. The specificity of some products may determine its entrenchment in its territory if we consider this know-how as a complex resource to activate, through interactions between technical, relational, cultural and cognitive components.*
We analyse the know-how associated with cheese production within a "small ruminants cheese-related" LAFS in Corsica. By combining approaches from the fields of anthropo-technology and cognitive ergonomics, we examine the existence and specificity of pastoral and cheese-related know-how as potential collective heritage resources. For doing this, we use the concept of territorially-anchored collective know-how (TACKH) in order to understand the knowledge encapsulated in interactions. Such complex issues result from both "ecological" dimensions of the natural resource (physical environment, pasture, animals) and human dimensions (cultural, organisational and cognitive) capable of activating these resources. Our main hypothesis is that the diverse knowledge relating to animal husbandry and cheese production in Corsica do not necessarily belong to the same cultural phase or category or to the same temporality of an inheritage building process. Their specificities result from different actors and registres of legitimisation; they must be combined rather than opposed within the negotiations for differentiating Corsican cheeses. Detailed observation based on video recordings and self-confrontation sessions enables us to identify some specificities in extensive breeders' TACKH. We highlight keys which may help in considering their future and their inclusion in an initiative aimed at developing a local dairy and cheese heritage.

Keywords: *heritage, resource, cheeses, know-how, anchorage, Corsica*

Context and issue

As our development policies are focussed on the attributes of the economic, social and ecological sustainability of human production, territory would appear to be an essential point of reference. The issue of a product's entrenchment in its "native region" leads researchers to examine the components of this type of product. The emerging question can be summarised as so: to what extend these local products may constitute resources to be activated by human collectives? Such resources seem to be relevant for collective management marked by identities and mean of acting rooted in a specific territory and therefore capable of defining Localised Agri-Food Systems (LAFS) (Aubron and Moity-Maïzi 2007)? This question is based on an initial hypothesis: an object (product, technique) is a repository and proof of distinctive identities, but also a support for consensus among actors enabling a patrimonialisation project to be pursued or developed for a group in a given territory (and implications in terms of power and legitimacy). This relies in a second hypothesis: in this dynamic management negotiated between the actors, debates relating to the particularities or identities encapsulated in a product necessarily examine the knowledge basis. Hence, knowledge and know-how form an essential element in identifying the link with a product's origin (Bérard and Marchenay, 2004).

As product of integrated free-range extensive breeding of ewes and goats throughout the year, Corsican cheese is the result of age-old traditions of processing the specific raw materials (local breeds, feeding off the scrubland) at first sight without anybody contesting its legitimacy. Nevertheless, no protection and an increasing interest of a market pulled by large-volume distribution (national and European) and by the huge summer tourist consumption, made this niche product, perceived as traditional (precisely because its is rooted in the historic territory of the Corsican agri-pastoral systems), appearing to be in danger from imitations produced outside the island or from the local industrial "vanilla-isation" of cheeses produced using milk imported from other regions.

The risk of imitations confuses breeders and farmer-processors[1]. Civil society is asked in an occasionally tense[2] social context. In fact, the dairy interprofession[3] has attempted to introduce official quality signs for a number of years with a view to enabling Corsican cheeses to be recognised and protected. Dialogue between actors is uneasy, both in terms of choosing a sign among the various possible Quality Assurance schemes and in terms of formalising identification and characterisation criteria for what "Corsican cheese" should be. One or the several identified types of specific cheese? What are the current production areas? Who should benefit from the assumed income from an official quality label and who should be excluded? A very diverse group of actors is currently facing the difficulty of qualifying (and therefore recognising) specific physical resources (local breeds, food, milk) interacting with breeding systems, managed according to constantly changing practices and know-how (breeding and milk processing). Discussions aimed at establishing collective choices deals with in one hand the complexity in taking into account all possible attributes to define a specific or "typical" product and in the other hand the political nature of the methods, tools and criteria of identifying the resource(s). Identification cannot reduce itself to the simplifying and positivist registre of a sacrosanct analytical technology or to a simple logic of co-opting by peers. Beyond the consensual choice concerning common criteria which would objectify breeding and dairy processing techniques, the implementation of these indicators by very different groups in a qualification process becomes the core element. For example, when certifying the origin of a local breed within the assessment of a cheese, the issue of qualifying a breed standard is compounded by the problem of controlling this on site. And the economic, social and ethical consequences of the collective establishment of agreements and criteria concern a given standard (which determine a breeder's adherence to or exclusion from the collective approach). A considerable volume of work has examined this question of authorities and criteria in the certification processes (Sainte Marie (de) Ch. and Casabianca F, 1998). Our position here is primarily to underline the very specific situation where different types of actor, trade and social and professional paths confront one another: dissymmetries are revealed between different cognitive and social frameworks, reflected in differentiated techniques difficult to describe and objectify in formal frameworks. We then evoke the particular dimensions of these cognitive resources integrated in the technical acts of breeding and dairy processing. It seems useful to differentiate those related to the production environment (natural and cultural ecosystem of the activity) from those related to the normative professional dimensions of formalised and verbalised "knowledge". We also underline the complex, progressive and highly relative nature of these resources that each individual today claims as being "traditional" in a collective patrimonialisation process: this is clearly a complex construction consisting of confrontations and hybridisations, a process rooted in the modernity of our economies, a product of a necessarily collective intention. Such a construction questions both the value of know-how invested with "tradition" and the clearly arbitrary nature of a social construction willing to integrate although it would seem forced to exclude.

Know-how: a resource unlike any other

Today, know-how is core in preserving localised resources. The "patrimonialisation" process of natural and cognitive resources is particularly important to the LAFS. It takes the form of collective action "overseen" by various institutional registres linked to the "historic depth" of the patrimony in question, which is both and object-emblem and economic and political resource.

An agri-food product emphasises nutritive functions (nowadays easily defined through physical and biological components) and the raw material from which it is made and which gives it its own identity able to differente it within an economic system. For some time, certification and origin labelled production have added the nature of the original production system (livestock, land, etc.) to these forms of distinction. Today, in an accelerated process of globalisation, cloning and imitations, the process also includes the cognitive aspects encapsulated in the finished product and which help to link a product to its place of production. This trend raises a set of questions for consideration, and even for legislation, about the conditions, methods and criteria for identifying and protecting systems of knowledge. Knowledge and know-how form an invisible, immaterial capital (with some refer to as social capital) and represent a distinct component of all human material resources. More than the physical or biological components, they proceed from constant, dynamic interactions between the

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[1] This constant anxiety is highlighted in the film produced by the students of the VALOR year group (Moity-Maïzi, Paquin, 2007).
[2] The headline of the "Corse Matin" newspaper in July 2007 examined the threats made by a separatist movement to milk importers.
[3] The dairy interprofession is an institution recognised by the state which brings together 3 bodies: industrial processors, milk-supplier and farmer-processor, to dicuss all problems concerning the sector.

individual and the group, the local and the global, the intentional and the imposed, the being and the having been (experience), the reality and the project, etc. in a constantly changing context.

Technical act and know-how as an anchoring point of the investigation

Although, generally speaking, several authors agree on the existence of "types" of knowledge, the definitions of "know-how" are not finalised per discipline. Deforge (1991) defines it as the capacity to undertake an activity successfully through personal commitment. Know-how contrasts with formal knowledge as not possible to be sold, copied or transferred. More recently, Barbier (1996), Moity-Maïzi & Muchnick (2005), Sigaut (2006) have favoured a distinction between know-how and knowledge in line with Chevallier and Chiva (1991), who identify know-how as "all acquired, incorporated and transmitted competencies which can be seen in the technical act and which require the mobilisation of a large volume of knowledge and representations" (Chevallier and Chiva, 1991). Know-how can therefore be "perceived in the physical attitudes of the individuals and in their ability to appraise, provide and master a technical process. Consequently, it cannot be reduced to either knowledge or technique". Know-how is therefore "*seeing forwards and backwards at the same time*"; as an ability to refer to past experience while anticipating a future situation, an ability which Détienne and Vernant (1974) relate to the Greek *métis*, a genuine practical and cunning intelligence which allows the craftsman who possesses it to adapt to changing situations. According to the authors, this form of intelligence combines "flair, wisdom, foresight, flexibility, dissimulation, resourcefulness, keen attention, the sense of opportunity and various entitlements", with "experience acquired over time". Schwint (2002) underlines the importance of temporalities and learning in a cognitive construction, lying somewhere between theory and practice, knowledge and action, *logos* and *praxis*.

Know-how is therefore not a "piece of data", definitively and immutably recorded in a human production. It evolves with the time and space in which we activate it. This dual relationship with time and space is particularly visible, both in the situated character of a course of action and in the importance of the socio-technical networks in which competencies act and are built. In this definition of know-how, territory appears as a possible material reflection of this dual relationship with time and space as basis of human knowledge, making it a genuine "*cognitive laboratory*" (Moity-Maïzi and Muchnick, 2005). If the temporality of know-how must be underlined, in particular in a collective qualification process, how can we identify, observe and describe the know-how qualified as "traditional" claimed by the local actors? In a resurgence of traditional Corsican cheeses, these actors are necessarily marked by interwoven histories and successive hybridisations. What signs or criteria, both technical and symbolic or even discursive, would enable us to identify with a view to distinguishing less "traditional" know-how? To answer this core question, we will assume that the technical style, such as the label of a fashion designer, is the key element: it is a sign, an almost indescribable indication of the creative identity (individual or collective) whilst remaining a prisoner of standards (Moity-Maïzi, 2008); style is a sign of both integration and exclusion, of tensions and recognition, conferring a status of otherness on the individual. It transcends the conflict between tradition and modernity through the meanings and forms of recognition it is revealing. Consequently, "seeing" the know-how would appear more pertinent than "recording" know-how dictated by standards. Identifying know-how with legitimate "tradition", at least locally, for the most part relies on observing and questioning these distinctive forms which facilitate differentiation within a group as well as each of its material productions. These stylistic distinctions do not emerge either in the dialogue of operators or in the repeated observation of the course of action and, more generally, the technique, given that *any technical action activates know-how* (Leroi-Gourhan, 1965). Observing technique in its different dimensions – operational, relational, cognitive and stylistic sequences – is therefore essential in identifying and formalising know-how. Characterise this know-how in a given group is also a question of understanding society: together with the linguistic act, the technical act is one of the three doors which open directly onto society (Guillet Escuret, 2003); the technical act is thus heuristic while the process creates observable artefacts (Latour and Lemonnier, 1994).

Consequently, in addition to understanding the techniques and know-how related to the process of transforming grass into milk and then milk into cheese, our "know-how" analysis also examines: (i) the relations between technical, relational and cognitive registres developed by the breeders to ensure their continued existence in a complex environment (extensive breeding); this leads us to understand the technical activity by means of a broad observation of the mechanisms implemented by the individuals within the socio-technical groups to which they belong; and (ii), territorial anchorage as a

process and resource for sustainable development, understood here as a vector of inter-generational transmission.

Without exploring such a vast domain with all its attendant controversies, we will quickly review the "technical act" to underline simply that it may be perceived as a first "anchoring point", common to the disciplines which examine human activities (Moity-Maïzi, 2008). Indeed we recall that any technique is identified in relation to a set of material and social conditions which are situated historically rooted and, at the same time, to constantly evolving collective or individual choices. It is always the result of natural, biophysical or biochemical conditions as well as compromises, adjustments and judgements. More precisely, it "*is defined by the mediation of the relations both between people themselves and between people, things and animals*" (Latour, 1993). The knowledge, value and symbols which form the framework of a technique are therefore necessarily at the centre of any investigation concerning material activities, their tools and products.

Historically speaking, technical acts are these multiple objects and actions (processes, gestures) which history and anthropology have regularly recorded and classified into major categories of material cultures. The criticism of this type of approach, summarised by B. Martinelli (1993), results in a notion already central to the work of A. Leroi Gourhan – the technical "trend": "*Based on a general and generic function, secondary functions follow on and interact at each stage of the act, revealing the choices and constraints which govern the path of the trend through the technical and cultural environment*" (Martinelli, 1993). The technical trend is therefore created by means of choices inducing the diversity of technical acts around the same function. There are several "ways" of bringing a herd together; and while certain cheese production tools belong to the same category of function, they are also worked, adjusted and stylised according to certain "principles" proper to each group. The trend is therefore materialised by means of, among other things, a "stylisation" (Martinelli, 2005) which affects the objects as well as the gestures and products of a technical operation.

The intention at the heart of a technical action cannot be reduced to reasoned anticipation or the simple expectation of a specific material result; it also targets social, symbolic or political goals within a range of possibles where social distinction and conformism to a reference group represent two very well-known categories of argumentation. Following this reasoning, we better understand why, from one group to another, from one culture to another, the objects catch the attention of the actor in different ways: for example, depending on his intentions, a breeder concentrates his attention primarily on his herd or on his pasture or on milking. The intention therefore explains the diversity of technical choices and of the values accorded to the objects and products of these choices. Moreover, it "releases" us from a simplistic position of thought opposing technical tradition consisting of incorporated habits with intentions, which are necessarily innovative.

Video collection: an ergo-ethno-numerical exercise book

By mobilizing various methods stemming from the ethnology and from the ergonomics (Moity-Maïzi and Bouche, 2008), we identified several relevant techniques to arrest together various registers technique, relational and cognitive constituent of the know-how:

- As far as the activity is still observable, the method of "the self-confrontation" borrowed from the theory of the progress of action (Theureau, 1992) allows, after video recording of the technical act, to return with an operator on its activity by mobilizing various registers.

- When the activity is not directly observable any more (old breeder, an activity moved in the time or the space), the method of "the interview of explicitation" proposed by Vermersch (2004) allows the operator to propose a narrative of its practices and knowledge.

- In these two methods, sound and video recordings allowed us to realize "crossed confrontations " with experts (technologists cheese makers, agricultural advisers.) or third parties (for example, confrontations between Corsican breeders and Sardinian, often close breeders on numerous points and for all that without recent connections).

We mobilized these methods within the framework of a global device of inquiry spread on the whole Corsican territory with "polls" on the nearby island of Sardinia authorizing a comparative approach. We met ovine, caprine breeders as well as craftsmen and dairy manufacturers, supplying a corpus of more than 150 hours of video recording. Our observations and filmed conversations concerned the whole productive process, some breeding in the marketing by way of the transformation cheese maker, by privileging the recursion of a " knowledge to pass on " on a large number " of usual activities

": learnings, coordinations, monstrations and demonstrations that they are realized in everyday lives or aggravated in festive environments. The treatment of materials was formalized by a computing platform SAPEVISTA so as to facilitate the filing, the deciphering, the formalization and the synchronization of the observations of any technical, relational and cognitive activity. We include the possibility there of realizing the coordinations, the positions and the movements of the actors.

Pastoral know-how at the heart of anchorage

In the oldest Corsican breeding systems (Ravis-Giordani,1983), the breeders always endeavoured to adapt to the often restrictive environment and to manage uncertainties over long periods of time. They consequently developed specific practices and know-how such as driving herds across vast territories, perfect recognition of their animals through certain indescribable signs or communication – using forms which do not necessarily involve common language – with and within pastoral socio-technical networks (Bouche, 2000), human relays essential to this type of extensive herding. As a result, Corsican dairy breeding is distinctly different from intensive breeding systems, at least with regard to its relationship with the natural and cultural environment. An extensive breeder is restricted here to viewing his production as a resultant of the unforeseen elements of the environment. These unforeseen elements can be seen: (i) on a daily basis in the bad weather; (ii) in the seasonal fluctuations between periods of scare water resources in winter and summer and more abundant periods which easily satisfy the food needs of the animals; and (iii) in the inter-annual variations where years with completely different profiles follow one another. The practices do not, therefore, aim to maximise the expression of the individual productive potential of the animal by cancelling out the effects of the environment, but to combine a number of individual performances within the entity of the "herd" being tended. We find in this the elements of a fundamental identity characterised by complex connections between a system and its environment[4]. Hence, while intensive systems stabilise and even out their dependence on the unforeseen events of the natural environment by increasing input levels (food supply, regulated temperature, etc.), Corsican breeders, to ensure their continued existence in a highly uncertain environment, have developed specific know-how which increases the complexity of their systems. This complexity involves both internal aspects of the system (breeder, herd, territory etc.) and the social links capable of supporting higher levels of organisation.

Pastoral herding over large areas (>300 ha) has, for example, enabled breeders to develop abductives reasoning mechanisms[5] and detailed knowledge of both their animals and the sites on which they graze them.In addition to an excellent capacity for adaptation to finding food in a difficult environment (stamina, agility, resistance, resilience), the herd must demonstrate intrinsic "social" qualities (gregariousness, existence of docile leaders, etc.); it must also be identifiable from a distance (diversity of colours). These qualities are expected, anticipated perceived and then maintained by the breeder by means of a specific practice of animal selection (interactions ❷ & ❶ Fig.1.). They assume an excellent knowledge of the behaviour of each animal in order to anticipate reactions when faced with different types of unforeseen event and to react to these situations appropriately. This knowledge is developed, accumulated in a dynamic process over a number of generations in a pastoral and social history which structures and regulates the forms and objects of inter-generational transmissions with a high level of precision.

While the shepherds tend their herds in this way, we note that they may be helped by others, often mobilised subconsciously, in particular with regard to the transmission of information. Extensive breeding relies on distributed herding, an essential and "instinctive" mutual aid which we will refer to as pastoral echolocation[6]: using a specific code (marks on the ears, colour of the animals, etc.) and a detailed knowledge of the toponymy of the land, the breeder can find a stray animal or establish the condition of a distant pasture by means of social information relays. Echolocation therefore relies on the existence of a network, conscious or otherwise, allowing the different users of the space to situate themselves. This communication technique requires a common vocabulary concerning the animals and the environment. Tending a herd in an extensive system therefore requires the implementation of specific listening mechanisms (which may sometimes provoke cognitive saturation) in order to connect

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[4] The theory of complexity presented by Wagensberg (1997) which postulates that: "The complexity of a system, minus its capacity of anticipation with regard to its environment equals the uncertainty of the environment minus its sensitivity with regard to the system.
[5] Abductive reasoning: capacity implemented by an individual to favour one particular scenario spontaneously over a host of other possible scenarios.
[6] in suggest this term in analogy to the system of managing bats.

to the pastoral networks and receive or emit useful information. This use of the land remains today, although the mobile phone is gradually replacing the presence of echolocation agents as the new communication media in pastoral areas.

More than maximising performances, the breeder wishes to optimise the system as a whole. As well as the choice of animals individually adapted to the ecosystem, this optimisation involves global herding which includes managing lineage, maintaining a gregarious herd, eliminating disruptive goats, etc. The homogeneity of a herd should be established as early as parturition. In addition to selecting the optimum renewal (20%), monitoring parturition enables the kids to be identified and paired with their mothers. This requires a constant presence and attention during the entire period to observe and memorise the relationships: "*personally, if I don't see the birth, I don't keep the kid as it might have been adopted*". Breeders with small herds applied similar practices (observation of the herd while tending it on a daily basis) to memorise[7] the mother-kid pairs. Obliged at present to increase the size of their herds[8] for economic reasons, they must adapt the cognitive and organisational artefacts enabling them to build a productive herd for which regulatory individual identification (tip-tag) would appear unsuitable and more particularly far removed from this essential identification and memorisation work. This is hindered by a natural grouping of births over a maximum of about ten days. They adopt various strategies which, for technical and economic results which are often very similar in the short-term, have very different long-term consequences.

Many such examples can be observed with regard to both tending the herd and identifying the vegetation best suited to feeding or treating the herd or most likely to damage the intended products: a particular pasture is potentially unfavourable to milk production in terms of volume or quality. This complex knowledge, rooted in a territory marked with toponyms (like so many signs for the collective memory), culturally relayed by socio-technical networks, is conveyed and even ritualised in society as a whole through sayings, proverbs or events which constantly refer to them.

In such a system, technical acts and cognitive priorities are primarily focussed on rearing the animal in its environment. The activity of transforming milk into cheese and its subsequent marketing are of secondary importance and may even be delegated to a third party.

If the breeder is also a processor, he may prioritise the different tasks perceived as essential to maintaining the overall coherence of his system. It is not a rare sight, for example, to see a breeder abandon a vat in the process of curdling to recover a lost animal. More bizarrely, the transformation vat may also be left unattended while the breeder listens to a neighbour who has information (concerning a stray animal). However, it is likely that of these two priorities, the second, i.e. the information and the linguistic communication, will be chosen over a lonely search for an animal.

In this context, even if real cheese-related know-how exists, everything takes place as if, from the transformation point of view, the operating chain aimed at quickly stabilising the milk proteins with a view to their conservation could at any time be sequenced, interrupted or delegated to a third party. Consequently, ripening the cheese, a sedentary activity formerly entrusted to women[9] or the old, is of secondary importance to the shepherd in relation to the piloting of the herd, the land and all the information which may contribute to the survival of the system.

Pastoral know-how: an archetypal model of territorial anchorage

From these observations we note that, in addition to its technical dimensions, know-how is connected to anticipation, communication and coordination requirements placing it firmly in the field of collective action. Even if the latter is not the product of a deliberate action, it remains essential to the individual viability of extensive pastoral systems, undeniably conferring on them territorial bonds.

In its traditional form Corsican pastoralism, forged over centuries in response to difficult conditions of production, can be analysed here as an archetypal model of territorially-anchored collective know-how (TACKH) (Bouche et al., 2008). This model enables us to classify and relate in a single entity, without opposing them to one another them:

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7 Some talk about a gift ("if you don't have the gift at parturition, when all the kids arrive at the same time, you're lost"), others refer to the need "to be born into it" to learn these skills.
[8] The average size is currently about 180 head, although some herds number 500 to 600 head.
[9] The know-how related to creating the taste is, in this context, transmitted in a household registre of female transmission rather like sewing or cooking.

- "phenotypical" competencies tested on a daily basis which are included in this know-how (for example anticipation, creating relations);

- The "genetic" attributes of these competencies making it possible to reproduce them locally from one generation to the next without for all that it being possible to generalise them in ubiquitous dimensions which would lead to their becoming commonplace, to the detriment of income based on originality;

We felt that it would be interesting to design and present this archetype, following Morin (1973), as being the heart of a process of multidimensional differentiation where organisational phenomena are inevitably part of individual-collective, natural-artificial and physical-cognitive dimensions.In this systemic approach, we analyse the TACKH as a "computational" node which connects 4 sub-systems where the significance and quality of the interactions are decisive in establishing its specificity and potential for patrimonialisation.
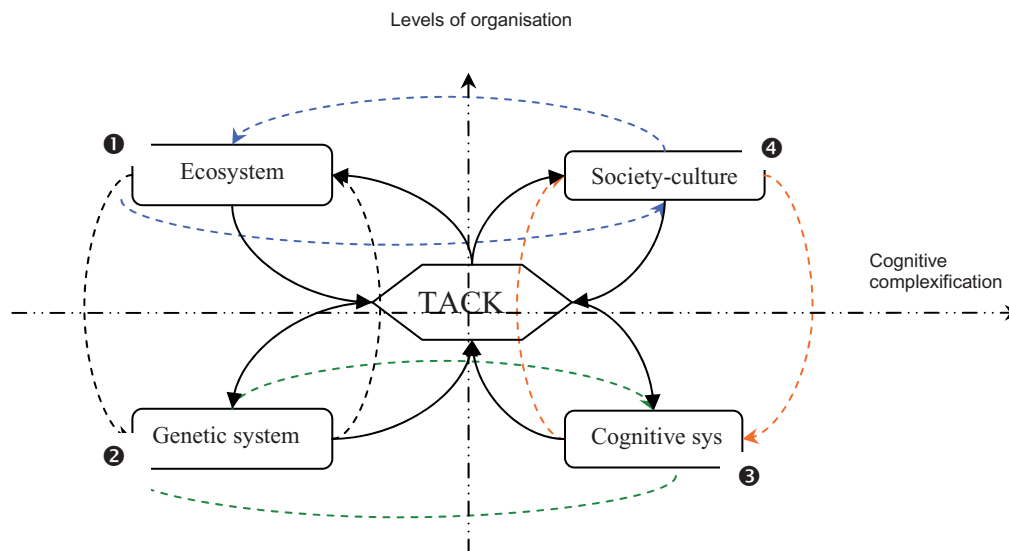

Figure 1: Territorially-anchored collective know-how at the centre of a complex process

By assuming an increase in the levels of organisation between physical phenomena (❷ from genetic coding to the ecosystem) and cognitive phenomena (❸→ from the individual cognitive system to social organisation), TACKH is therefore dependent on and an actor of:

- ❶ the particularities of the natural environment incorporated into the product;

- ❷ the significance of a genetic system which is both productive (technical) and memory-based (society);

- ❸ a cognitive system specifically dedicated to understanding, memorisation and communication between sub-systems.

- ❹ the social and cultural environment, a vector of distribution and transmission and an engine of evolutions and innovations. It is in this cultural environment that the "epidemiology of representations" would occur (Sperber, 1996).

Innovations and hybridisations

Cheese-related know-how in a dynamic perspective:

These pastoral systems continue to mark the collective representations of Corsican breeding and therefore of its products. There are numerous icons of the shepherd, gun on shoulder, crossing the high plateaux with his goats (see, for example, the labels on cheeses produced industrially). The image is active: it "sells" a cheese renowned by the technical system (breeding) to which it refers, desired by an ever increasing clientele who are particularly attached (attachment being founded here on memories, tales, prejudices, symbolic images etc.) to farm products which today represent almost 30% of the market of Corsican cheese.

In light of this keen interest, the question is whether any particular know-how exists concerning cheese production suggesting the same type of entrenchment as that of the breeding, thereby unfailingly associating pastoralism and "traditional" cheese production in the same model or TACKH.

Identifying this know-how with regard to milk processing would actually appear to be a more delicate task. On the one hand, the existence of a large-scale and regular milk processing activity on the farm would seem to be relatively recent. Several parameters explain this: we have seen the priorities given to breeding; the island has also long been marked by a considerable rural disuse and, as late as the 1970s, by the almost systematic presence of Roquefort industrialists for the collection of ewe's milk or *calenzana* cheese ripeners for the ripening of goat's cheese… Farm production, virtually systematic in all herds during the 19th century, was reduced until the 1980s to a few rare herds or was concentrated in the summer periods during which the major industrialists closed their dairies. Last century, it was also possible to observe "milking sales": a family would reserve a certain number of milkings from a breeder; the latter would deliver this order "in white material", i.e. 1 to 2 days after curdling, so that the buyer only need deal with the maturing process. These practices clearly differentiate (in the processing operating chain) the "milk stabilisation" sequence (renneting, curdling, cutting the coagulum, moulding, salting) which is performed quickly or even abruptly[10], from the ripening sequence (washing, turning) requiring patience and observation, and which is a much slower process. The breeder's strategy was to curdle the milk, break this substance then put it in the mould as quickly as possible in order to return to his herd. Strong salting and turning the mould a few times in a "casgile" (underground cave) would then allow the cheese to be transported to the ripening site. The final taste was doubtless not an objective either for the breeder or the processor. This preparation phase was too far removed (in time and space) from the consumption itself; however, it was highly dependent on the quality of the milk and the breeder knew this: the "old men" can still produce knowledge concerning the effects of the herd's food or the climate during the production process.

These cheese-producing techniques have, in part, been transformed under the pressure of innovations prescribed by cheese technicians or industrialists: replacing wood with aluminium[11] and now by stainless steel and plastic, the development of the cold chain, vacuum sealing (replacing salting or smoking), the use of stabilising additives such as lactic acid bacteria to minimise production accidents etc. These developments are immediate technological reflections of a three-fold change in food habits, economic realities and health standards.

Hybridisations and professional distinctions:

Since the 1970s, with the development of the collection and subsequent withdrawal of the Roquefort industrialists, public authorities have widely subsidised a more sedentary and mechanised breeding process, previously based on transhumance, as well as subsidising farm processing techniques in the form of aid for installing workshops which satisfy European standards. The farm commodity channel, which today represents about 30% of cheese volumes produced by 350 breeders, is gradually assuming a real economic role. It is nevertheless confronted with new challenges to overcome:

- Old knowledge, representative of a tradition and identity which is above all pastoral, is today diffuse, diluted or mixed with know-how advocated by the Roquefort company which recruited numerous local breeders turned cheese makers. This is how, over the past twenty years, both industrialists and specialist farmers have developed a "tomme de corse", a technological blend of a traditional cheese from the south of the island and industrial innovations. Some know-how is reconstructed exclusively according to the lore of old transhumance herders. A phenomenon of "percolation" occurred between different types of know-how, mixing the knowledge of technicians in the dairy industries and the empirical knowledge of the shepherds;

- Younger inhabitants have come to live on the island, either returning to Corsica having completed their university studies or arriving from the mainland as new rural dwellers. They defend the know-how gained from their training, adding to this the local experience or information from their new socio-technical networks;

- New reasoning emerges, in particular that of lessening environmental effects to reduce uncertainties and make the systems safe. Knowledge of the herd and the environment

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[10] An industrial production manager informed us of the "violent aggression performed by traditional shepherds to break the noble curds… but that is doubtless how they invented brocciu"

[11] Many directional road signs made from galvanised anuminium have been converted into draining boards.

diminishes, all the more so as greater use is made of technology (cold room, inputs etc.) to guarantee the efficiency and technical performances of breeding and milk processing;

- Current breeders tend to concentrate their cognitive efforts and learning on this new technology by calling on specialist technicians form schools and dairies with formalised knowledge (good practice guide, agronomic or zootechnical manuals etc.);

- Breeding know-how is henceforth dissociated from cheese-making know-how. Job specialisation has developed and combining the two activities is now an individual commitment, organised and encouraged more by militant or idealist than functional references.

Finally, the "farm" cheese sector would seem to prove attractive to younger inhabitants. It has nevertheless lost its reference framework, its "old men", and it is in large part a result of the intensive supervision of the breeding and cheese production activities in Corsica.

Consequently, with more and more workshops satisfying European standards and an increasing preoccupation with "hygienist success", farm specialisation adopted by young inhabitants obliges them to develop new farming know-how. To ensure successful cheese transformation of a "healthy, loyal and commercial" product they, like other craftsmen, are confronted by technologies directly imported from the dairy industry and its schools. These are prescribed by the health services and presented as being essential in satisfying the standards.

In this new configuration, the cheese-producers implement know-how which can be considered as conventional and conventionalised procedural know-how of the coorporation due to the extent to which it is formalised and interiorised by means of the training and regular monitoring of technicians. These new cheese-producers make less and less use of their capacities for cognitive adjustments as the like unforeseen events and technical variances are now anticipated, evened out and corrected by technologies introduced throughout the process: equipment allowing milk to be filtered, temperature control tool (cooler) or flora control by yeasts, ripening regulation by means of cold rooms or vacuum-sealing etc. Know-how is ever more exempt from an in-depth understanding of the natural environment and a local cultural mediator: its acquisition is no longer dependent on deep cultural immersion but results from a close relationship with a cheese adviser from the chamber of agriculture together with equipment suppliers, all of whom possess formalised know-how referring to technical literature.

At the same time, observing certain practices deemed to be "family practices", but which demonstrate inherited know-how and involve tools the use of which is generally discouraged by the technical standards, provides a number of additional reference points which, while not all-powerful, can certainly be used for comparison.This observation results in unexpected technical hybridisations, later claimed to be "technical traditions" typical of cheese-making know-how.

Knowing how to breed an animal or make a cheese:

Attention would seem to be shifting away from the animal towards the material (milk, cheese), a process which will change the cognitive mechanisms. And while animal and milk are two categories of living elements, optimisation of the milk is made considerably easier and safer by the implementation of technology, thereby causing the dissociation of breeding from milk processing. There is no longer any need, as some pastoral breeders still believe, to maintain connections at all costs or to be familiar with the complex knowledge of an ecosystem or cultural links facilitating extensive herding.

These distinct cognitive and cultural concerns are reinforced by the localisation of the activity. The framework in which the breeding activity is deployed is no longer the same as that of dairy processing: large areas are still required to drive a herd of goats while a closed, aseptised area is necessary for the milk processing process. These spatial distinctions, which are subject to different standards relating to specialised job groups, doubtless play an important role in the development of know-how and the possible perpetuation of the necessary associated skills such as observing, listening and anticipating phenomena.

In addition to the relationship with the object and place, another distinction can be noted behind the commercial relationship resulting from the sale of the product. Whereas income from milk sold by the breeders to dairies depends on a simple volume, fatalistically dependent on good or bad years, the sale of a finished product to consumers brings new dimensions into play which condition the very legitimacy of the activity: the quality of the milk with regard to health concerns, the taste and

appearance of the cheese (and the associated symbolic representations) are combined with the imperatives of volume. When in contact with the customer, a farmer who is removed from a systemic anchorage in his traditional territory through his "technique" while nevertheless remaining a legitimate representative of this territory will make every effort to invest in an excessive legitimisation of his territorial roots: typical cultural objects in his shop or on his stall at a rural fair, dialogue concerning the know-how and complex practices which give his cheeses their particular quality etc. It is not the reference to a collective organisation enabling a connection with echolocational agents across the territory which is emphasised in this "posture", but the social link with the technical resources of advisers and with the structures capable of legitimising a product differentiation in relation to industrial products (fairs and markets) or of providing evidence of real cultural roots (association, union).

Conclusion: dynamics of anchorage like a wave to be developed in a differentiated system of action

This journey through collective on pastoral and on cheese-related know-how demonstrates the particularities and a territorial anchorage essentially connected to breeding knowledge which is still very present due to the specific conditions of extensive pastoral breeding. In order to survive and flourish, this requires a genuine entrenchment in the understanding of suitable genetics (of the herds), the methods of using a natural environment and the implementation of specific cognitive and relational processes (echolocation, etc.) all of which must necessarily be reticulated by "cultural" inscriptions enabling them to be activated and transmitted (language, rituals, etc.). Nevertheless, this anchorage – so deep, so "natural" and so robust[12] - for a given generation place the person concerned at the heart of encystments of practices and know-how which evolve very little, are difficult to grasp from a technical point of view and are therefore difficult to transmit and teach to the subsequent generations. They have difficulty in co-evolving with the cultural and social environment in which their informative practices are rooted (Bouche *et al.*, 2008). Here, the transmission of knowledge involves the perpetuation of adaptive traditions mainly outside the realm of language. Oral tradition as a potential accelerator of change is, by contrast, revealed through the relations that the "new breeders" try to create with the "old men". It is difficult to transmit in current society and unsuited to innovations and therefore to adaptation. Furthermore, we note that in many cases, these viable, robust and stable systems have only a limited perspective in a collective future, as the future[13] must be immutable and identical to the present. Repositories of pastoral identity, with no particular aggression, they do not appear particularly active in a militant field in claiming identity, recognition or protection.

Inversely, we remain circumspect in light of the weak bonds which characterise cheese production by craftsmen or industrialists whose entire know-how consists of withdrawing from a possible territorialisation of the bonds, or by "new cheese producers" who depend on standardised good practice guides and who, perhaps unwittingly, de-territorialise cheese production. Hence, cheese-related know-how developed at present would more and more seem to be a slave to an essentially ubiquitous dairy technology which distances them from cultural components and a link with the land. Often deployed by younger individuals in search of cultural legitimacy, projects of development are far more numerous. We also note of this category of mouthpiece breeders their level of militant commitment. They are armed with a conscience which mobilises them in the political construction of roots and an identity-conferring heritage which they perhaps reinvent. It is they, the ideological force of protestation and legitimisation, who can bring to life a collective project.

In other words, following Moity-Maïzi (2008) who states that "*territorial entrenchment is not necessarily a process of patrimonialisation; it is a part of this process, a stage still subject to the uncertainties of creative drifting…* […] It *also reveals the heritage of know-how and all the ingeniousness of groups in innovating, ruling and finding compromises which affect both an operation and an entire commodity chain to reinforce an identity in relation to a production area or even to call into question the inequalities*", we postulate, in a highly utopian manner, that the future of the TACKH of Corsican cheese-producers must, in addition to new forms of standardisation of techniques or products, examine the political, managerial and innovative coordination required for three components which

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[12] Defined as the capacity of a system to maintain its performances despite changing conditions of use or the presence of uncertainties linked to its parameters or components G. TAGUCHI, S. CHOWDHURY., S. TAGUCHI, Robust engineering, McGraw-Hill, New York, 2000.
[13] "The future here is to survive" we were told by a goatherd, as a challenge, whom we interviewed about his projects for evolution (Bouche., 2000)

today appear as incompatible as they are improbable and which can for the moment be caricaturally referred to the worlds of Boltanski and Thévenot's (1991) conventions:

- traditional breeders ("*civic*" guarantors of a collective interest in maintaining a traditional cultural heritage) who possess know-how and who, if they are left to their own devices to pursue an activity of extensive breeding and to produce a specific raw material "with a taste of the maquis", nevertheless appear encysted, generating little change and rarely accessible beyond an initiated "*domestic*" sphere;

- the movement of new cheese-producers rooted in the distinct spheres of "inspiration" (innovation concerning farm products) and "opinion" (rural fairs), militants of a new farm-based and insular "identity framework" which tends to make the activation, expression and perpetuation of the previous item possible; and

- finally, in the registres of justifying the "commercial" and "industrial" worlds of cheese production by means of massive publicity programmes, the industrialists, to increase awareness and recognition far beyond the insular borders and product specificities, abandoning any reference to the complexity of the socio-cognitive resources which are nevertheless the bases of these TACKH.

It is doubtless by means of an intelligent combination of these three components, with a view to shifting from "being together to acting together" referring to the categories of collective action described by Livet and Thevenot in 2004, that a mixing, a learning, an essential dialectic between the centrifugal forces of progress and globalisation and the centripetal forces of anchorage and patrimonialisation should be performed for the future of this LAFS and an interprofession under pressure. Can we see this intermixing in a conclusive metaphor such as a wave, a roller, which rises and takes shape, foaming under the ideology and technology of young cheese-producers only to become one again, one wave further on, with the significance deeply rooted in the mass (breeders) pushed and carried along by the power of the dairy industries like a tide drawn by the star of economic profitability.

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