

# The prospects of pastoral sheep and goat dairy systems in the Mediterranean to cope with global changing: An analysis from the Corsican case

J.-P. Dubeuf<sup>1</sup>, M. Valenti<sup>2</sup>, J.-M. Sorba<sup>1</sup>

<sup>1</sup>INRA -LRDE, SAD. Campus Grossetti, 1, 20250, CORTE, France

<sup>2</sup>Chambre régionale d'Agriculture, Boulevard du Fango, 15, 20200, BASTIA, France

---

**Abstract** - For millennia, small ruminants in the Mediterranean were associated with agro – pastoralism, as a set of practices to manage sustainably spontaneous resources on a wide variety of fields. Today, these practices like transhumance fascinate sustainable development experts and inspire them in terms of territorial resource management and bio – diversity or know – how preservation. But, yet, and specially for particularly in dairy and cheese production, pastoral components of the production systems have steadily keep on declining as a technical model in favor of more specialized, more controlled, more intensive systems. Regarding the challenges and changes facing livestock at climatic, environmental, and social levels, can pastoralism help to reconfigure livestock systems, contribute to the agro-ecological transition and, if so, under what forms?

To contribute to the construction of a sustainable pastoral strategy for Corsica, we conducted a survey among pastoralists we analyzed the organization of their breeding, their performances and expectations. The results of these interviews testify to the diversity of the technical choices and organization of pastoralists to match their activities with their personal projects; we show that they are often far from traditional representations of pastoralism. They can serve to build new technical models with new coherences based on qualified skills territorial levels. We discuss and compare the situation in Corsica to other situations in the Mediterranean.

**Key words** : technical models ; production systems ; prospective ; dairy systems ; pastoralism

**Les perspectives des systèmes laitiers pastoraux ovins et caprins en Méditerranée face au changement global : Une analyse à partir de la situation en Corse.**

**Résumé** - Pendant des millénaires, l'agro – pastoralisme en Méditerranée, auquel sont associés les petits ruminants, a permis de gérer durablement des ressources spontanées sur des terrains très variés. Il est à l'origine de pratiques qui fascinent aujourd'hui les spécialistes du développement durable et les inspirent en matière de gestion des ressources territoriale et de préservation de la bio - diversité. Pourtant, le pastoralisme ne cesse de reculer, en tant que modèle technique au profit de systèmes plus spécialisés, plus contrôlés, particulièrement en production laitière fromagère. Compte tenu des défis et des changements globaux que l'élevage doit aujourd'hui affronter, le pastoralisme peut-il contribuer à reconfigurer les systèmes d'élevage, et à la transition agro – écologique et si oui sous quelle forme ?

Pour contribuer à la construction d'une stratégie pastorale durable pour la Corse, des enquêtes ont été réalisées auprès d'éleveurs se réclamant explicitement de pratiques pastorales. L'organisation de leur élevage, leurs performances, leurs attentes sont analysées et discutées. La diversité des choix techniques et d'organisation des éleveurs, de projets personnels et de modes de vie recherchés sont souvent très éloignés des représentations traditionnelles du pastoralisme. Les références produites peuvent servir à identifier de nouvelles coherences basées sur des compétences qualifiées au niveau individuel mais également au niveau territorial. L'approche développée en Corse est mise en perspectives d'autres situations en Méditerranée.

**Mots clés** : modèles techniques ; systèmes techniques ; prospective ; systèmes laitiers ; pastoralisme

---

## I-Introduction

Corsica is a mountainous island located in the Central Western part of the Mediterranean basin. For millennia, pastoral activities associated to subsistence crop production have influenced the organization of the social life and pastoral culture keeps still in the minds and mental models of a large part of the Society. We have chosen here the most common definition of pastoralism as a type of animal production based on the pasture of the spontaneous forage herbaceous and ligneous resources of rangelands. Pastoral production in Corsica was not specialized but dairy production and cheeses were an important part of these activities. A high percentage of lands could not be mechanized but grain could be produced until high altitudes (Ravis –Giordani, 2001; Mercury, 2013). The progressive extinction of subsistence agriculture during the 20<sup>th</sup> century has contracted the space used by animals with a growing and general re-in forestation. One answer for animal production has been to settle in the few lowlands areas and continue to reduce the use of rangelands. Abandoning the high summer pastures has been also the consequence of the decrease of the number of breeders who in addition, prefer better conditions of living and working.

We consider this situation is not specific to Corsica and characteristic of what happened in many Mediterranean regions where traditional pastoral systems have been marginalized, seen as archaic and doomed to disappear.

Comment citer ce document :

Dubeuf, J.-P., Sorba, J., Valenti, M. (Co-dernier auteur) (2019). The prospects of pastoral sheep and goat dairy systems in the Mediterranean to cope with global changing: An analysis from the Corsican case . In: 1st Joint Meeting, FAO-CIHEAM Networks on Sheep and Goats and on Mediterranean Pastures - Efficiency and resilience of forage resources and small ruminant production

Simultaneously, we observe in these areas, an important loss of bio – diversity, a degradation of pastoral landscapes with erosion and closed scrubs and an increasing risk of forest fires in less and less controlled territories. Meanwhile, everywhere, pastoral practices and know-how, appreciated typical products as cheeses fascinate more and more both citizens, local stake – holders and the development experts are inspired to manage territorial resources and to redesign technical systems to answer agro – ecological transition issues (Dubeuf et al., 2016). In Corsica, the Regional authorities have decided to make pastoralism one of the priorities for the development of the island to face the new challenges of global changing and because more lands could be available in pastoral areas (Padduc, 2014). With a rather fantasy but not documented perception, they considered also that pastoralism would have high potentials; and they took several initiatives to define an operational pastoral strategy (Dubeuf, et al., 2018)

From the Corsican example, the objective of this communication is to identify at what extent agro – pastoralism could be a way to re design technical models of dairy small ruminant animal production and for what objectives.

## II-Presentation of the regional approach in Corsica

### 1- Methodology

The approach chosen to help building an operational strategy for pastoralism in Corsica is participative, prospective and based on a documented diagnosis of the present situation of the breeders regarding the pastoral components in their systems. Our hypothesis is that we need to document the present situation to produce landmarks on the productions systems, the breeders' practices and expectations. It has been supported and this project is financed by regional authorities and based on 3 main activities:

- A review of the available information and existing references on pastoralism in Corsica; The documents published between 1970 and now have been reviewed and analyzed to give a general view of the dynamics of pastoralism in Corsica and the main observed changes.
- Several interviews in sheep and goat farms on their pastoral practices, the expectation of the farmers, and the main technical and economical results; at this stage, 13 breeders were interviewed (10 during the study and 3 during a previous project), 7 with goats, 4 with sheep 2 with a mixed sheep and goat herd. All the breeders considered pastoralism is their type of animal production and they expressed how they see it. In the results a special focus was given on food autonomy and the interactions between the utilization of natural rangelands, their management and the distribution of external food (produced or bought hay and feed stuffs). The question of the pastoral products and the interactions between pastoralism, and the definition of pastoral products by consumers and prescribers have also been analyzed.
- The organization of thematic workshops involving the main actors of pastoralism in Corsica to share points of view about pastoralism and build a collective approach to define an operational strategy. The results of the first two activities will be mobilized during the on – going workshops.

### 2- Results

#### A. *The characteristics of the pastoral farms, their performances and practices (table 1)*

-Localization of the farms, land structure available and pastoral practices: Only three farms are located at an altitude above 500 m and two are in lowlands. Nevertheless, 11 from the 13 have no mechanized lands and most of them cannot produce hay or grain. Some of them cut some hay in far lands borrowed by colleagues but most of them buy hay (and mainly from the continent in the Southern France plain of Crau specialized in the production of high quality hay protected by a DPO). Most of the lands are rangelands with a mixed vegetation of shrubs and herbs associated or not to woods. 10 of 13 farms practice transhumance on summer pastures but only one process cheese during the transhumance what means that only dry not milked animals go to summer pastures and the average duration of transhumance is below 2 months so significantly shorter than the traditional practices (4 months were reported). All the farms receive subsidies from the first Pillar of the CAP but only for a variable part of the land they use.

- Structure of the herds and production practices: The average total livestock is around 200 heads and between 150 and 250 heads of sheep or goats except in one farm of 400 heads but located in the coastal plain. These results confirm the regional statistics showing that a majority of the bigger sheep herds are located in the plain with production systems based on natural or cultivated grasslands. In our case, the only herd located in the plain used natural and not irrigated lands and the farmer considers itself he has pastoral practices. The local sheep breed is the Corsican breed for which a rather efficient scheme has been organized since 20 years. The goat breed is also mainly the Corsican breed but without neither an efficient selection scheme nor a collective organization although the local breed is old breed adapted to the local conditions and many animals are crossed animals. 11 of the 13 farmers are farm made cheese makers although they could sell a variable part of their milk to industrial cheese makers.

Comment citer ce document :

Dubeuf, J.-P., Sorba, J., Valenti, M. (Co-dernier auteur) (2019). The prospects of pastoral sheep and goat dairy systems in the Mediterranean to cope with global changing: An analysis from the Corsican case . In: 1st Joint Meeting, FAO-CIHEAM Networks on Sheep and Goats and on Mediterranean Pastures - Efficiency and resilience of forage resources and small ruminant production

- **Technical performances and food efficiency:** The average milk yield per female is between 70 and 219 l/year for goats and 81 and 133 l/year for sheep. These performances are far below the average yield of both sheep and goats production systems in France but rather similar what we observe in many other Mediterranean similar pastoral conditions. Otherwise, we cannot connect directly these yields to the amount of distributed hay and concentrate. While many references on the Mediterranean pastoralism consider that range lands can supply more than 65% of the total needs of animals we observe here high variations with pastoral autonomy indexes between 22% and 75% but with an average under 50%. From these data, we can assert :

- That range lands have the potentialities to provide a high amount of the forage supplies for the animals,
- That the control of pasture and pastoral management require high skills, know – how and references which have been lost in many cases,
- That there is great variety of rangelands and a good evaluation of their potentialities has to be characterized.

Thanks to a good valorization of the cheese and high milk prices, with good conditions to sell the kids ( but not the lambs), and in spite of rather poor technical performances and high food costs, the pastoral farms can provide acceptable incomes for the farmers. Besides these results can be obtained as long as they receive subsidies from the CAP and they accept hard conditions of living. These conclusions agree with the conclusions of the typologies elaborated by the local regional chamber of Agriculture (Lafitte L-M., 2019, Idele, 2017).

These collected data are annual and for a given year. It would have been interesting to observe their inter- annual variability. The sanitary state of the flocks (specially for goats often highly impacted by paratuberculosis and other diseases) and the unpredictable higher frequency of drought periods due to climate changing could affect the regularity of the performances.

**Table 1 – main technical and economical results of the interviewed farms**

NR : not recorded

Identification	G1	G2	G3	G4	G5	G6	G7	S1	S2	S3	S4	G51	G52
Localisation (<500m, >500m)	<500	<500	<500	<500	<500	<500	<500	<500	<500	>500	Plaine	<500	>500
Village	Prunelli	Palasca	Sto Pietro di T	Corte	Sarolla	Oletta	Olmetto	Casanova	Murraciale	Afa	Tallone	Appietto	Venaco
Age of the farmer (I<40years; II 40_55 years; III >55years)	II	II	II	I	I	I	III	III	I	II	III	II	III
Sheep/Goat	goat	goat	goat	goat	goat	goat	goat	sheep	sheep	sheep	sheep	goat	sheep
<b>Size</b>													
Total number of heads	230	249	302	240	245	182	207	133	208	260	432	213	232
Total female	170	203	234	160	220	142	160	113	169	210	360	160	200
Males	20	8	25	10	15	18	35	4	29	40	60	18	20
Young ewes/young does	40	38	43	70	10	22	12	16	10	10	12	35	12
<b>Lands used</b>													
mechanized land (ha)	0	0	0	0	0	0	0	0	0	0	10		0
range lands (ha scrubs and herbaceous without summer lands)	420	273	211	400	180	106	310	37	170	40	50	60	140
dominant vegetation (herbaceous or ligneous)	L+H	L	L+++ wood	L+ wood	L+H	L+++ wood	L	H	L	H	H	L+H	L+H
lands receiving subsidies (ha 1st Pillar)	NR	NR	NR	120	100	47	55	NR	65	20	NR	30	22
Purchase of hay (kg/year)	20800	8760	13000	30000	30000	15750	8000	15000	26000	13200	77625	17500	20000
Purchase of concentrates (kg/year)	17920	13890	29200	47500	30000	7200	13360	20000	15000	37500	139892	23500	15000
Transhumance to summer lands (Y/N)	O	O	O	N	O	O	N	O	N	O	O	O	O
Duration of transhumance	2	2	2		2	2			2	2	2	2	2,5
Mountain cheese making (Y/N)	N	N	N		O	N			N	N	N		N
<b>Production</b>													
Total milk production (l/year)	18000	25000	26600	35040	32450	18000	17920	17967	15041	27930	39600	10800	16200
Milk production/present female	106	123	114	219	147,5	127	112	159	89	133	110	67,5	81
Milk production/milked female	138	171	133	241	161	181	140	161	105	145	114	112,5	135
fecundity (%)	94	83	85	91	92	70	75	99	90	90	97	60	66
<b>Food autonomy</b>													
Estimated total food requirements A (LUF)	76116	83289	100137	86270	107703	65840	69950	50195	69996	93236	139892	93026	46520
Distributed food intake B (LUF)	34524	37490	25940	66325	60002	18653	18424	35002	41002	46375	87502	47250	28650
Estimated food intake by rangelands (A-B) (LUF)	41592	45799	74197	19745	47701	47187	51526	15193	28994	46861	52390	45776	17870
Pastoral autonomy Index (A-B/A*100)	54,64	54,99	74,10	22,89	44,29	71,67	73,66	30,27	41,42	50,26	37,45	49,21	38,41
<b>Economic Results</b>													
fecundity (%)	17280	16498	19400	31550	23200	8680	10148	13900	25995	21186	29200	11500	11500
Feeding costs (€/present female)	1	1	1	1	1	0	1	1	2	1	1	1	1
Sold milk product (€)	45000	57500	45220	79322	42000	40500	61200	38000	69998	42000	12600	47500	28650
Cheese product (€)	45000	57500	45220	93325	42000	40500	61200	18000	48000	131158	54600	78570	31200
Total dairy product (€/l)	7560	8640	15120	4500	7560	4320	6000	1120	8050	25500	25500	104070	31200
meat product (€)	52560	66140	60340	97825	49560	44820	67200	18000	49120	139248	54600	92570	31200
total product (€)	35280	49642	40940	66275	26360	36140	57052	4100	23125	118062	25400	92570	31200
<b>Margin on food cost (€)</b>													

## B. Pastoral products: beyond stereotypes, foods to qualify [SORBA]

In many studies on pastoralism and its definition, the products are often forgotten. But, defining pastoralism and its potentialities is also defining its products, how they are qualified. A recent research on this point has shown the total dissociation between the product, the food, and the conditions in which it has been produced. The selling points are generally minimalist and give few elements on the qualities given to pastoral cheeses. In main land France, cheeses are sold on purchase platform and in Corsica, direct sale is more common. In the first case, commercial stereotypes are dominant (natural conditions, the aesthetics of pastoral landscapes) with a permanent reference to the use of raw crude milk; in Corsica, the use of crude milk is considered as usual and the cheese eaters associate them more to very general pastoral conditions (the breed, fantasy traditional practices). The market arguments are very weak in all cases and do not consider the pastoral production conditions. The diversity of cheese types is not related to the diversity of production systems.

Comment citer ce document :

Dubeuf, J.-P., Sorba, J., Valenti, M. (Co-dernier auteur) (2019). The prospects of pastoral sheep and goat dairy systems in the Mediterranean to cope with global changing: An analysis from the Corsican case . In: 1st Joint Meeting, FAO-CIHEAM Networks on Sheep and Goats and on Mediterranean Pastures - Efficiency and resilience of forage resources and small ruminant production

### III-Discussion: What levers for dairy pastoralism in Corsica?

In Corsica, like in many other Mediterranean situations, small ruminants pastoralism is related to dairy and cheese production. We know that in many mountain areas, we observe a renewal of pastoralism for sheep and cattle meat production systems. But, the results presented above and their variability show that the production systems are not yet fully stabilized. In these conditions, at what extent considering the special zootechnical requirements of the animals, pastoralism could be also a solution for production systems including milk? We observe that at a large extent forage autonomy is absent of the systems and presently the purchase of hay outside the island is the rule. In dairy systems, the distribution of hay and concentrates during critical periods (early lactation, late pregnancy) is necessary to control production and we know there is a lack of lands for hay near most of pastoral farms. The organization of a regional collective autonomy at the island level could be imagined as a solution to stick to agro – ecological objectives. Besides, and it is another critical point, the total amount of distributed hay and concentrates could be reduced in many cases without impacting the productivity of the herds. The traditional know – how have been at a large extent forgotten and it should be necessary to produce the references and practices to reconquer and manage the pastoral spaces, to make them available and attractive to the animals. Paradoxically, because the price of the products and the market demand are high, the context is not very incentive to a controlled management of the complementation.

Pastoralism is no more an archaic and extensive type of animal production. It requires high technical multifunctional skills, innovation and should be intensified in qualified labor. One way could be to acknowledge its ecological services to found protected areas and follow agro – ecological principles. Qualifying and certifying pastoral food according to the conditions could favor the acknowledgment by the society. Such dynamics would require a collective mobilization, a good coordination between the several actors and a strong public support with a good capacity to define a clear strategy.

### IV-Conclusion

The Mediterranean area has to face important challenges at a short term dead line related to climate changing, water and food shortages and the future of animal production or the management and development of hinterlands are ones of these challenges. We have shown here that the case of Corsica is very relevant to identify and face these issues. In spite of nostalgic visions, the rural societies will not be anymore what they were and the return to the past is neither possible nor desirable. For example, no young farmer would accept to give all his time to build stone walls and terraces. It is necessary to imagine new technologies, new know how mobilizing for instance digital ones, new knowledge to answer the present environmental and ecological challenges.

### References

- Collectivité territoriale de Corse, 2015. Plan d'Aménagement et de développement durable de la Corse. 5livrets ; 8 annexes. [https://www.aue.corsica/Le-Padduc-dans-son-integralite\\_a47.html](https://www.aue.corsica/Le-Padduc-dans-son-integralite_a47.html)
- Dubeuf, J.-P., Sorba, J.-M., 2018. Les politiques publiques en faveur du pastoralisme en Corse : Objectifs, représentations, mise en œuvre opérationnelle et visions de l'avenir. AME ; n°5 ; septembre 2018. pp 29 -48
- Dubeuf, J.-P., Hassan, A.-A., Chentouf, M., Mena, Y., Pacheco, F., Boutonnet, J.-P. 2016. The Mediterranean sheep and goat sectors between constants and changes over the last decade. Future challenges and prospects. In: The value chains of Mediterranean sheep and goat products. Organisation of the industry, marketing strategies, feeding and production systems (p. 43-52). *Options Méditerranéennes. Série A : Séminaires Méditerranéens* (115). Presented at FAO-CIHEAM Network for Research and Development in Sheep and Goats, Montpellier, FRA (2015-06-16 - 2015-06-18). Zaragoza, ESP : Centre International de Hautes Etudes Agronomiques Méditerranéennes (CIHEAM)
- Mercury François-Noël, 2013, « Le pastoralisme en Méditerranée, Un exemple : le pastoralisme corse », In : Bergers de Corse et pastoralisme en Méditerranée, <http://www.francois-noel-mercury.fr>.
- Ravis – Giordani, Georges ; 2001. Bergers Corses : Les communautés villageoises du Niolu ; 505 pages, Albiana éditions.
- Sorba, J., Millet, M., Casabianca, F. (2016). *Enjeux et conflits de légitimité sur l'origine territoriale des fromages corses*. Presented at FAO-CIHEAM Network on Sheep and Goats , Montpellier, FRA (2015-06-16 - 2015-06-18). 5 p.

Comment citer ce document :

Dubeuf, J.-P., Sorba, J., Valenti, M. (Co-dernier auteur) (2019). The prospects of pastoral sheep and goat dairy systems in the Mediterranean to cope with global changing: An analysis from the Corsican case . In: 1st Joint Meeting, FAO-CIHEAM Networks on Sheep and Goats and on Mediterranean Pastures - Efficiency and resilience of forage resources and small ruminant production