

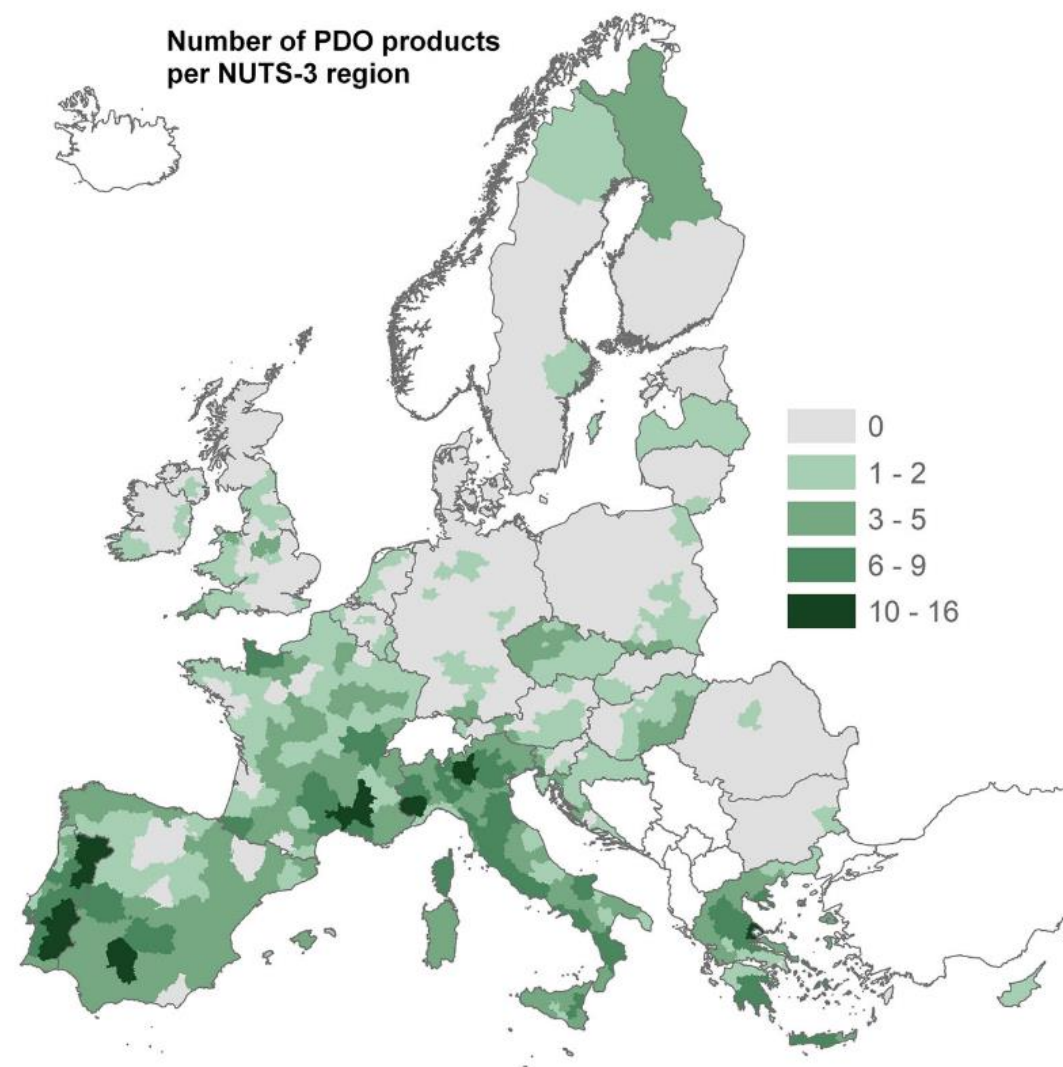
From labels to landscapes: mountain products with specification of origin or quality can help maintain grasslands and their ecosystem services



Introduction (1/3)

Number of products with Protected Designation of Origin (PDO) usually correlate positively with sustainability indicators in European Union (Flinzberger et al., 2022)

Indicator	All EU28 products	Cheeses
Ecological and cultural indicators		
High nature value farmland	0.39*	0.27*
Natura 2000	0.22*	0.13*
Corine ^b landcover richness	0.48*	0.30*
Semi-natural farmland ^c	0.39*	0.21*
Tourism beds	0.22*	0.13*
UNESCO World Heritage sites	0.23*	0.13*
Organic farming	-0.06*	-0.05



Introduction (2/3)

However:

- Scale of certain products question their 'local' character; ~200,000 t Grana Padano produced in Italy, using 24% of national milk production and ~40% exported (Bava et al., 2018)
- No ecological improvement of ecological condition in PDO areas compared to non-PDO areas; i.e. Ladotyri Mytilinis cheese in Greece (Vakoufaris et al. 2010)
- Large scale export of local products can have negative effects; i.e. Mexican Tequila with designation of origin (Denominación de Origen) (Bowen and Zapata, 2009)

Introduction (3/3)

- Two hundred millions of litres of Tequila produced in Mexico in 2005, > 50% exported
- Decrease of genetic diversity and number of varieties of cultivated species of agave
- Decline in soil conservation practices
- Increased incidence of pest and use of pesticides

(Bowen and Zapata, 2009)



Most of the time positive correlation between PDO and environment but...

...we need to understand the causal mechanisms between PDO products and ecological condition.



Method

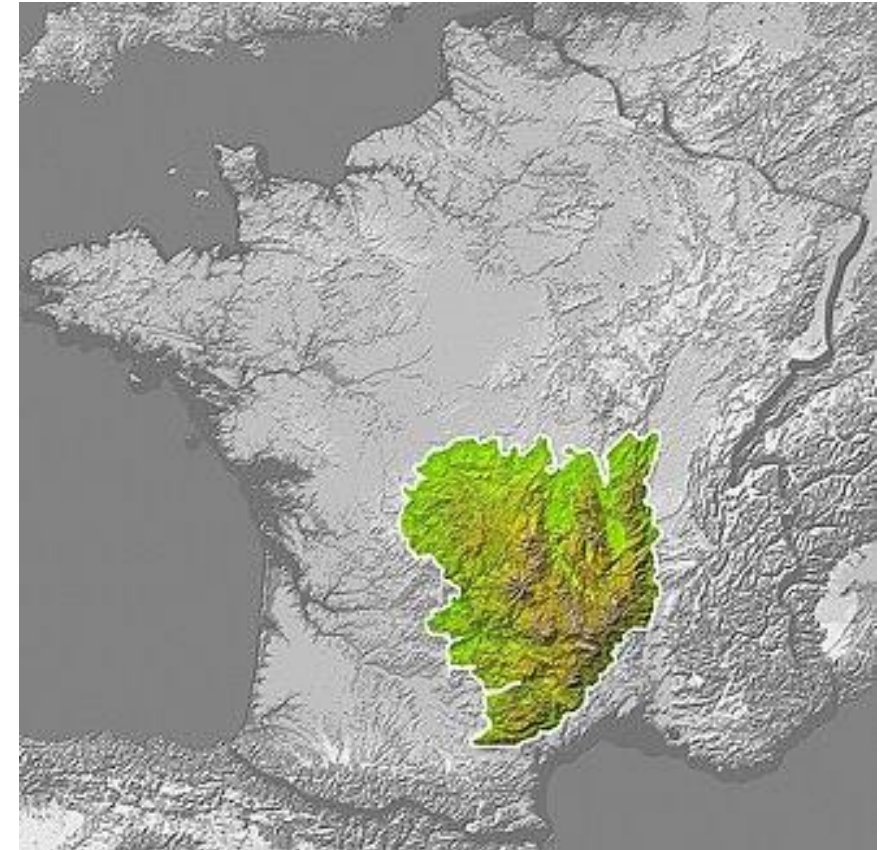
1/ Case study: 7 cheeses in Massif Central (France - alt. 300-1880 meter asl) where both PDO and non-PDO farm co-exist for comparative approach

2/ Qualitative analyse of the 'specification documents' of the cheeses ; causal link between the land (terroir) and the product must be explained in written form in the French PDO system

3/ Quantitative analyse of a sample of farms regarding production (e.g. milk/cow/yr), land occupation (e.g. % permanent and temporary grassland, croplands) (Inosys, Local PDO organisations, INTAQT EU project)

4/ Assessment of resulting levels of regulating ecosystem services (e.g. water purification or pollination) as proxy of ecological condition (use of the calculator with scores 0-5 by Joly et al. 2024):

-> permanent grassland> temporary grassland>cropland



Results (1/3)

All specification documents mentions the role of grass and 5/7 mention its effect on taste, e.g.:

Cheese	Causal link between the geographical area and the quality or characteristics of the product
Salers	“fed on grazed grass , the cows consume a diverse and aromatic flora that contributes to flavours the milk and consequently the ‘Salers’ cheese produced from it.”
Laguiole	The forage they consume is rich in aromatic plants , which flavour the milk and consequently the ‘Laguiole’ cheese produced from it.”
Saint-Nectaire	“Due to this botanical diversity, numerous aromatic compounds are present in the flowers (for example terpenes) and are assimilated by the cows when they consume forage from these grasslands. These factors, combined with cheesemaking know-how and the care given to ‘Saint-Nectaire’ during ripening, give it a variety of lactic flavours and ripening-environment aromas , often enhanced by a subtle hazelnut note.”



Results (2/3)

All specification documents have rules regarding feeding and land management e.g.:

Examples of rules (Q = quantified ; M = mentioned)	Salers	Fourme d'Ambert	Laguiole	Bleu d'Auvergne	Fourme de Montbrison	Cantal	Saint-Nectaire
Animal diet rules							
Feed origin (PDO area)	Q	Q	Q	Q	Q	Q	Q
Concentrate limitation	Q	Q	Q	Q	Q	Q	Q
Proportion of grass in the diet	Q	Q		Q	Q	Q	Q
Land management rules							
Maximum stocking rate		Q		Q	Q	Q	Q
Permanent grassland constraint							Q
Protection of native flora							M

90% of permanent grassland
in farm grass area

Results (3/3)

Less concentrate and milk productivity in PDO farms, but more permanent grasslands and regulating ES levels

	PDO						Non-PDO
Farm characteristics	Bleu Auvergne/ Fourme Ambert	Cantal	Cantal/ Salers	Laguiole	Fourme de Mont- brison	Saint Nectaire	
Number of farms in the sample	167	5	5	3	13	15	11
Milk production (l/cow)	6419	6030	5569	5003	7383	6510	7796
Concentrate (kg/livestock unit/yr)	931	1141	994	1384	969	1239	2076
% of permanent grassland on-farm	68	70	89	93	66	99	45
% of cropland on-farm + off-farm	14	16	15	23	17	15	33
Score of regulating services (on-farm)	2.17	2.25	2.38	2.43	2.33	2.51	2.03

~+15% of regulating services supply in PDO compared to non-PDO

Discussion: expected chain of causality

PDO product taste and typicity
given by:



- Semi-natural resource (e.g. permanent grassland)
- Low input extensive farming practice

- Specific soil and/or climate
- 'Traditional' know-how
- Special post processing technics

Positive causal
relationship between
PDO and ecosystem
services



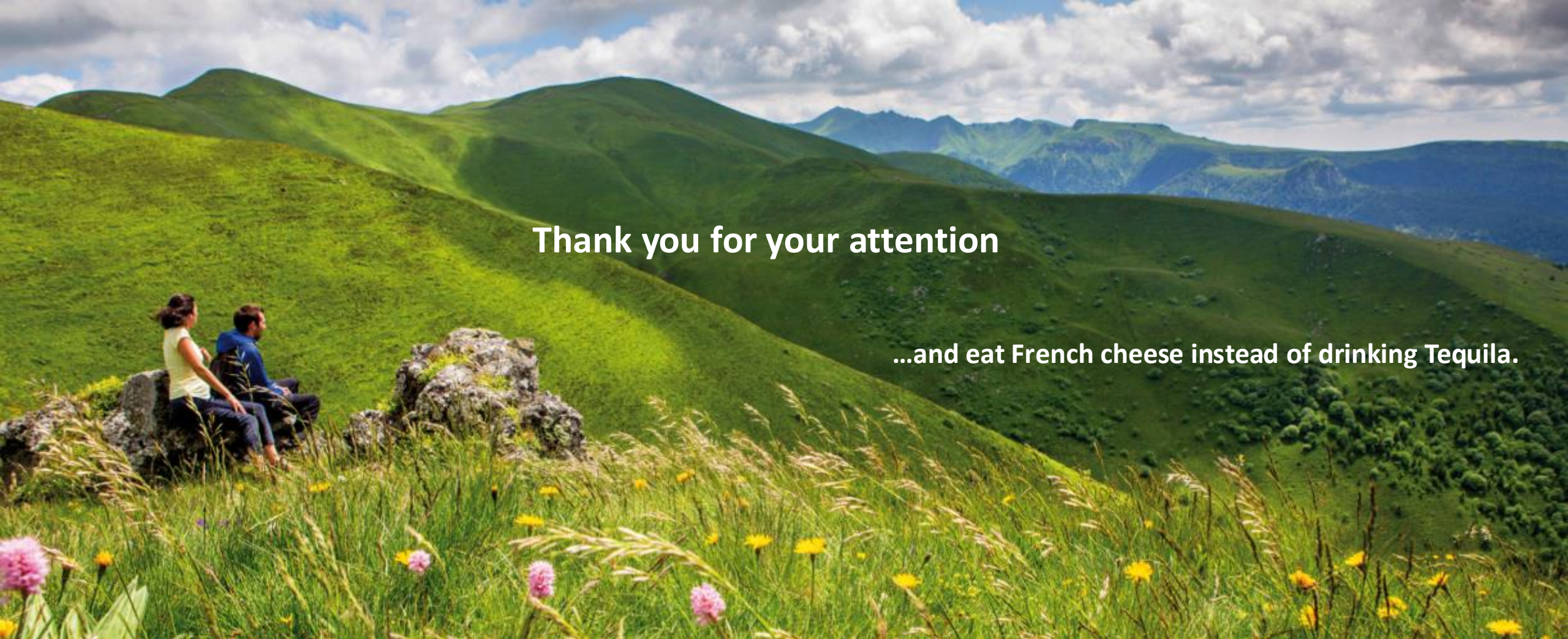
No causal relationship
between PDO and
ecosystem services



Conclusion

In our context, PDO products can help maintain grasslands and their ecosystem services.

Globally, PDO products can play a positive role in the sustainability of food systems, however conditional, compared to labels focus on environment such as organic agriculture.



Thank you for your attention

...and eat French cheese instead of drinking Tequila.

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