

Economic implications of a protein transition: Evidence from Walloon beef and dairy farms

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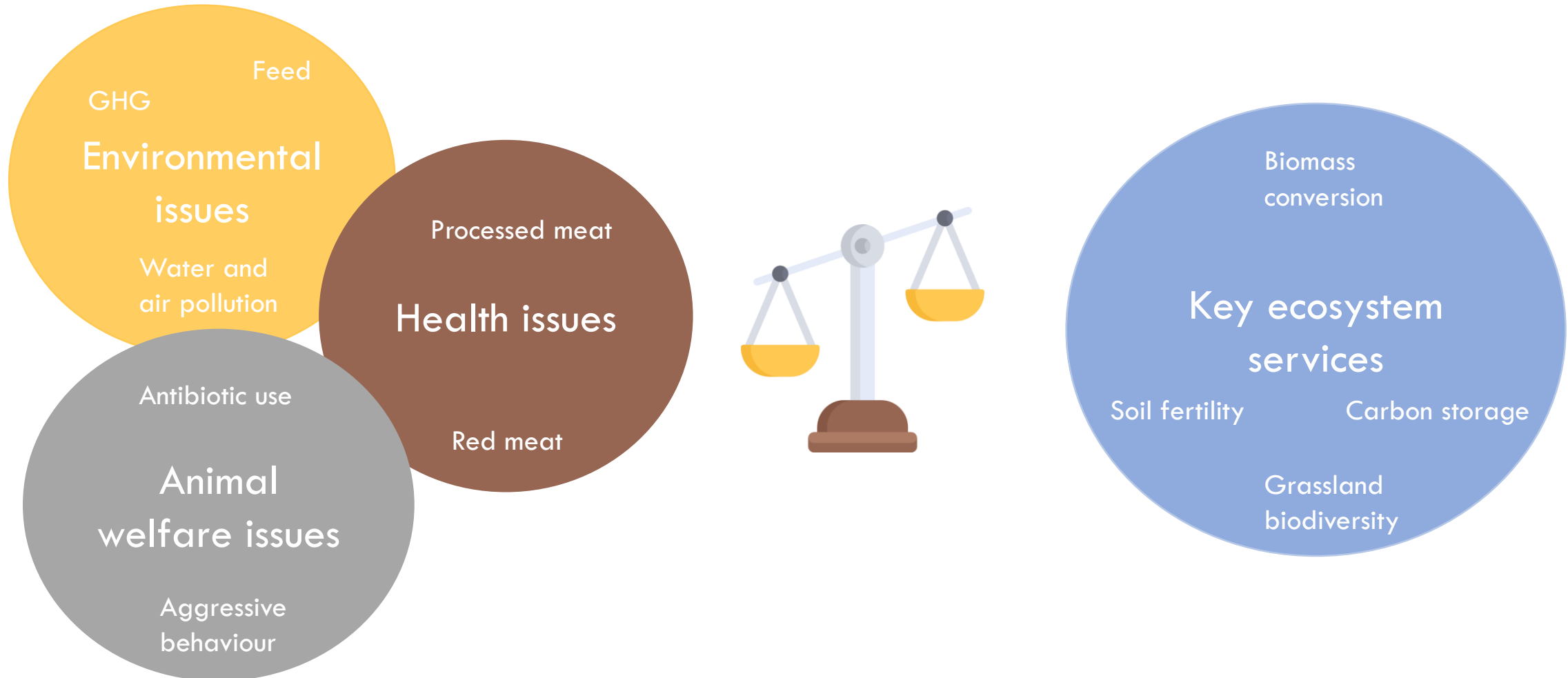
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Source: *Le lait wallon* (2020)

Livestock production is confronted with major challenges



The protein transition as solution?

Protein transition :

Rebalancing of protein consumption between animal and alternative proteins



→ Better for the **environment**, for **health** and **animal welfare**

The Walloon context

~ 5,000 dairy farms
~ 6,500 beef farms } 1,1 million cattle

Diversity of livestock production systems

Farmers' incomes often unprofitable and depend on subsidies

Dependence on feed imports



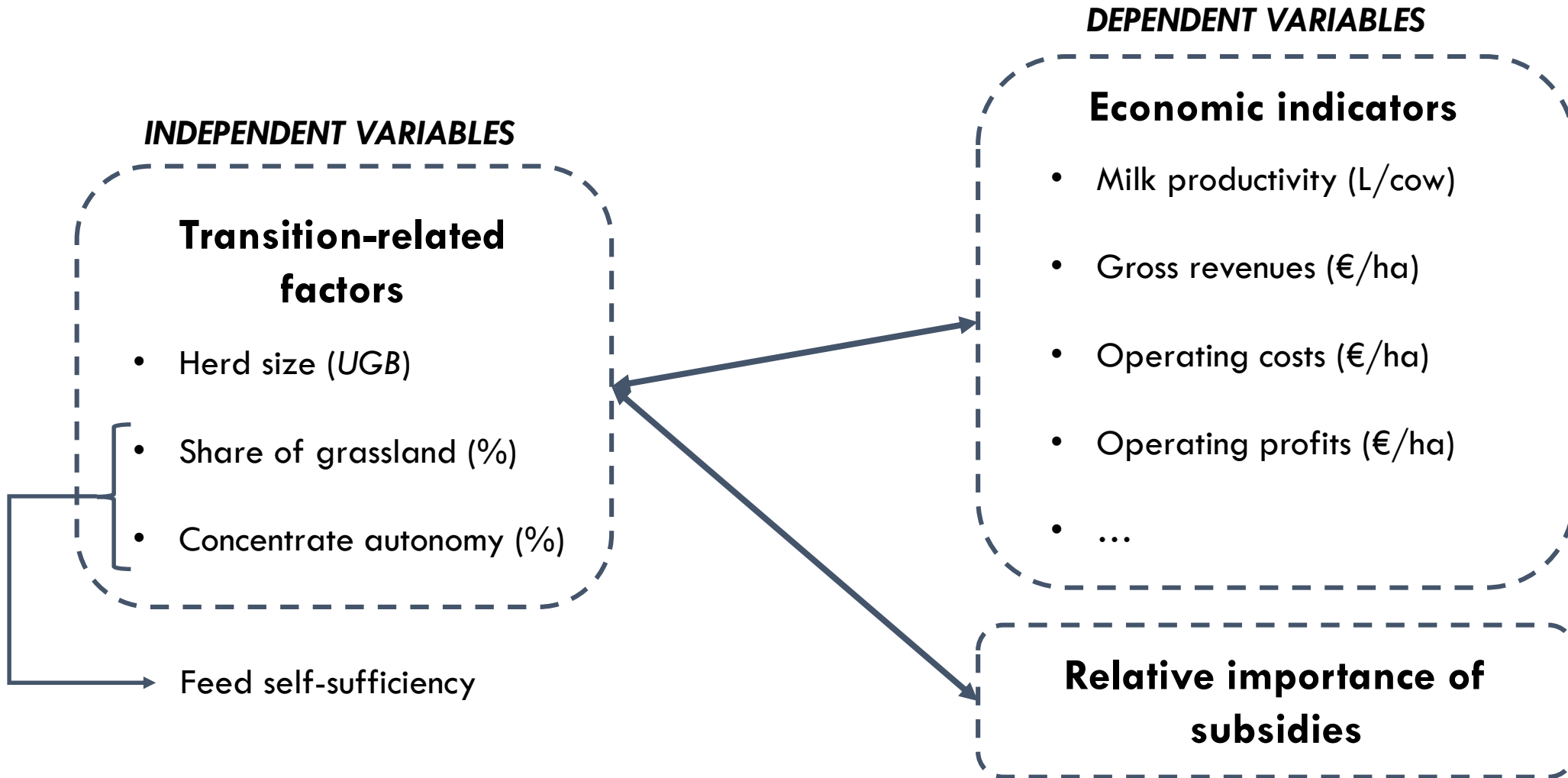
Research questions

- 1) How will the protein transition impact the **economic performance** of Walloon **beef** and **dairy** farms ?
- 2) Will the **two sectors** be impacted in the same way?
- 3) What is the relative importance of **subsidies**?



Source : De Vylder, Unsplash (2022)

Three factors associated with a protein transition



Data and methods

Database: Farm Accountancy Data Network (FADN)

Specialized dairy (OTE450) and **beef farms** (OTE460)

Panel data: 2014-2017

Unbalanced pool

Number of observations:

- **Beef sector:** 208 – 65 farms
- **Dairy sector:** 324 – 95 farms

Data analysis: Random model effects

$$\text{Model estimated: } Y_{it} = \alpha + \beta X_{it} + \theta_t + u_t + \alpha_i + u_{it}$$

Dairy farms are more profitable and less subsidy-reliant

		<i>Dairy sector</i>	<i>Beef sector</i>	<i>Sector comparison</i>
Number of observations		<i>N = 324</i>	<i>N = 208</i>	
Name	Unit	Mean	Mean	Two-sided p-value
Milk productivity	L/cow	6,322.60	/	/
Gross revenues/ha	€/ha	2,918.37	1,810.21	***
Operating expenses/ha	€/ha	1,319.06	1,061.78	**
Operating profits/ha	€/ha	1,599.30	748.43	***
Operating profit margin	%	55.57	42.35	***
Subsidies/ha	€/ha	402.08	600.62	***
Subsidy dependence	%	0.13	0.28	***

Significant differences tested using two-sided t-tests: $p < 0.1^*$; $p < 0.05^{**}$; $p < 0.01^{***}$

Dairy farms rely more on the use of concentrates

		<i>Dairy sector</i>	<i>Beef sector</i>	<i>Sector comparison</i>
Number of observations		<i>N = 324</i>	<i>N = 208</i>	
Name	Units	Mean	Mean	Two-sided p-value
→ Herd size	LSU	121.40	147.43	***
Grazing livestock density	LSU/SFL	1.96	2.23	***
Cattle area	Ha	64.73	68.64	
→ Share of grassland	%	84.37	88.07	**
Concentrate total	Kg/year/farm	122, 581	73,620	***
→ Concentrate autonomy	%	6.00	18.78	***
Labour	Annual work unit	13.54	27.56	***

Significant differences tested using two-sided t-tests: $p < 0.1^*$; $p < 0.05^{**}$; $p < 0.01^{***}$



Dairy sector

	Gross revenues a	Operating expenses b	Operating profits c = a-b	Operating profit margin d = a/c
Herd size				~
Share of grassland			~	
Concentrate autonomy	~			

Arrows represent a statistically significant correlation at 1% or 5%.

→ Extensive grazing systems providing environmental services and economic benefits



Beef sector

Farms characteristics uncorrelated to the majority of economic indicators

High correlation with subsidies

Grazing livestock density and cattle area positively correlated to subsidies per hectare and subsidy dependency

Economic losses

→ Business model based on subsidies rather than on actual market supply and demand factors

Conclusions

The economic implications of the protein transition are very different depending on the sector.

Policy implications:



Dairy sector: promotion of more autonomous production systems based on-farm fodder production



Beef sector: policy shifts to gear a protein transition in which breeders are not left behind

Thank you for your attention !

Article available in **Frontiers in Sustainable Food Systems**



LINK TO ARTICLE

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