Protein Self-Sufficiency
-
An indicator for Resilience in Dairy?

Charel Thirifay – CONVIS
Luxembourg
R4D – 31.01.2024

Contents

CONVIS = Cooperative farmers association in Luxembourg

4 Departments:	Dairy cattle, Beef cattle, pigs and advisory
Allied company:	Commercialization of cattle, pigs and semen
In Ettelbruck :	Administration building with headquarters of departments and services, exhibition hall and collecting point for animals
Employees:	85
Members:	750
Customers:	1.164

Advisory Department

Employees: 13

Main fields of activity:

- **fertilization** planning
- **sustainability** monitoring (Life-Cycle Assessment)
- **animal** production advisory
- Advisory in **water protection zones**
- **administrative** advisory service
- And much more

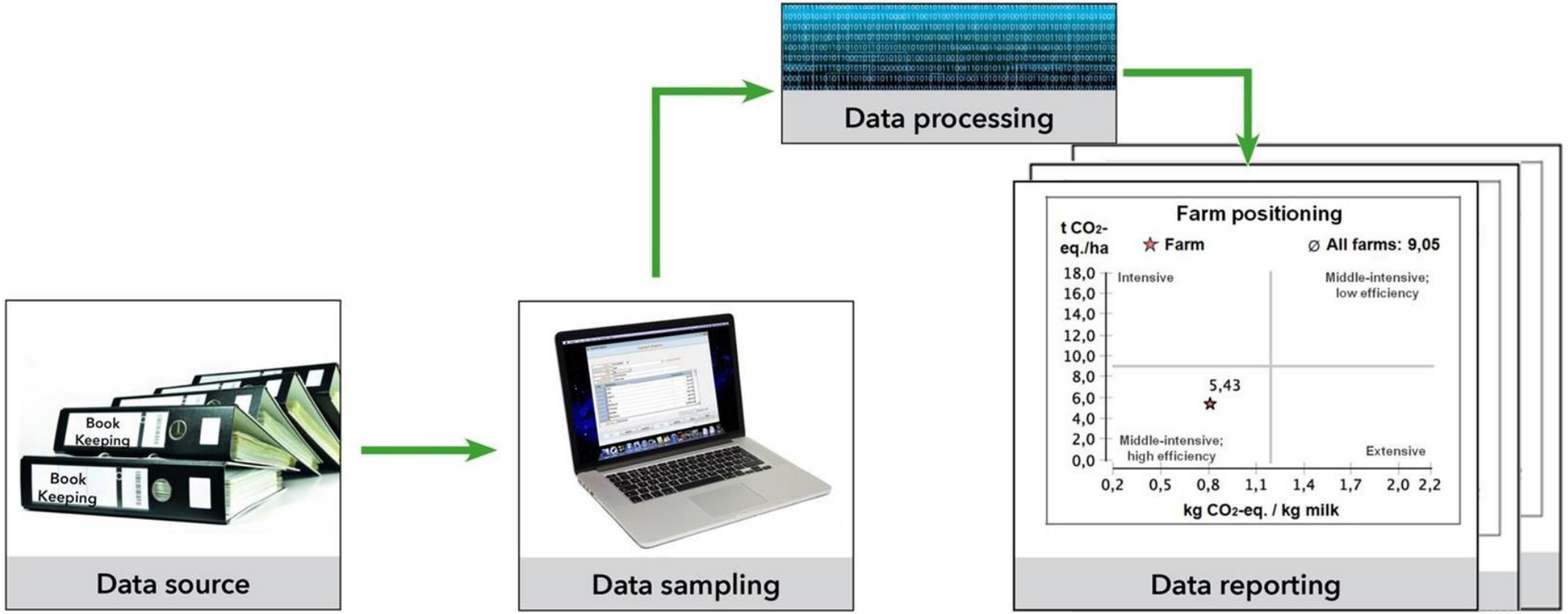
Advisory Department

Employees: 13

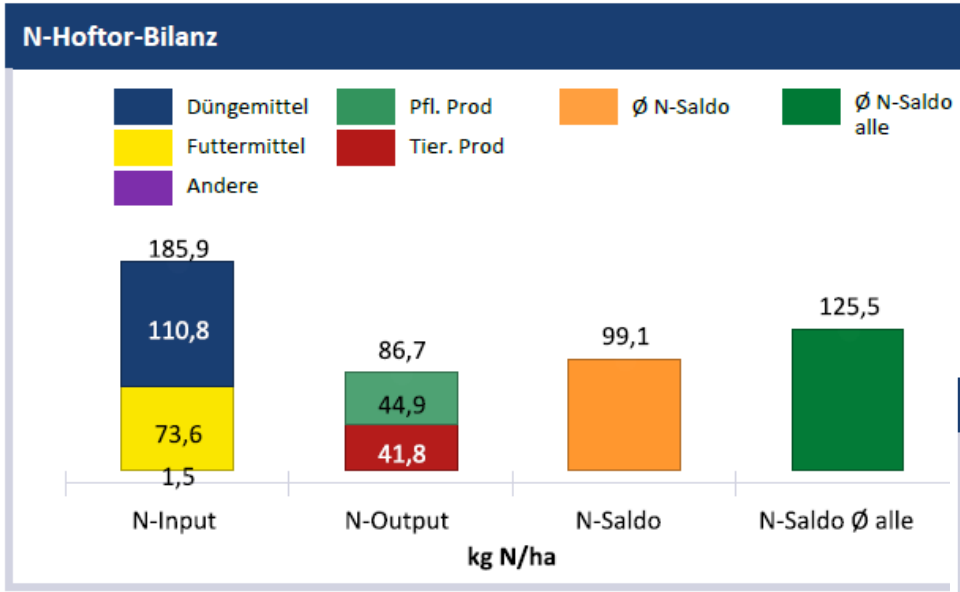
Main fields of activity:

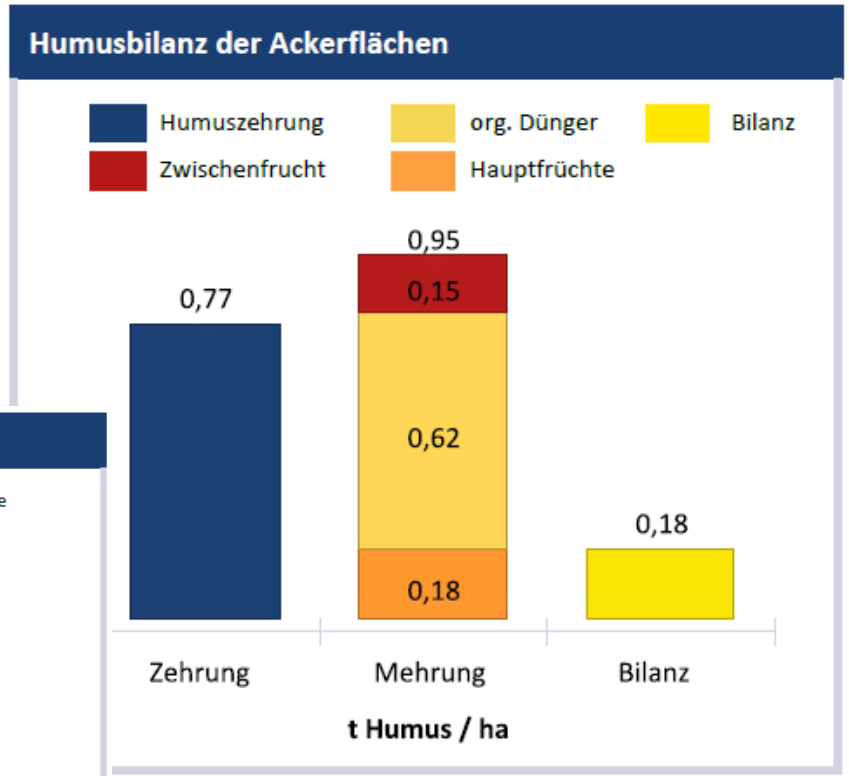
- **fertilization** planning
- **sustainability** monitoring (Life-Cycle Assessment)
- **animal** production advisory
- Advisory in **water protection zones**
- **administrative** advisory service

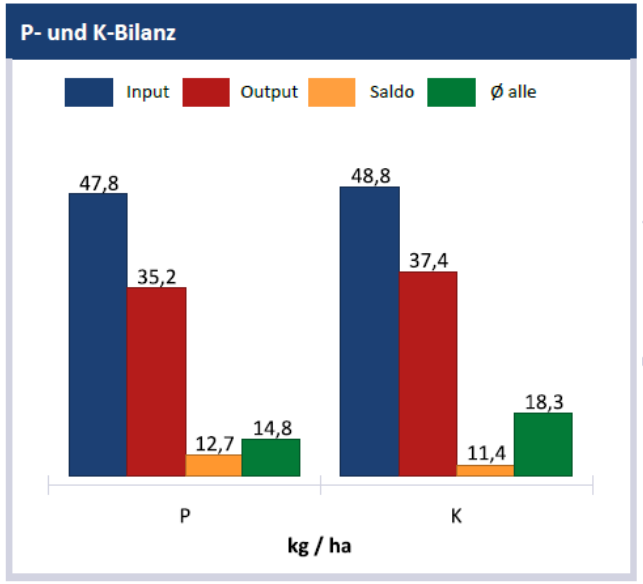
The CONVIS sustainability monitoring:
In 1,5 hours from row data to farm evaluation



Monitoring the farm system







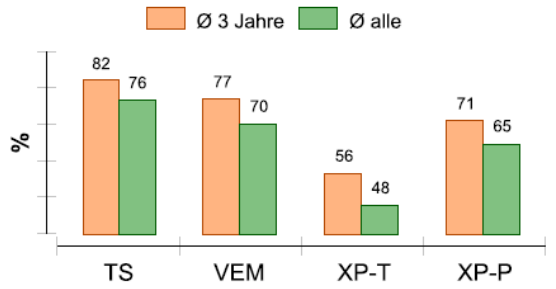
Düngeeffizienz	Marktfrüchte	Silomais	Grünland
N-Düngung-Min (kg/ha)	128	89	89
N-Düng-org verf. (kg/ha)	14	47	25
N-Ernte (kg/ha)	109	220	99
N-Wirkungsgrad (%)	77	161	87

Monitoring the Dairy Production

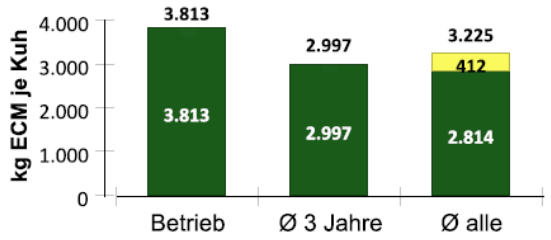
Kennzahlen	Betrieb	Ø alle
Futterfläche gesamt (ha)	92,7	86,7
Eigengetreide (ha)	4,1	7,3
Silomais (ha)	14,9	16,7
Andere Ackerkulturen (ha)	0,0	0,6
Grünland inkl. Feldfutter (ha)	73,7	62,2
Anzahl Milchkühe	79,6	88,7
Jungvieh	94,4	93,1
GVE/ha FF	1,4	1,6
kg Milch/Betrieb (verkauft)	637.175	699.847
kg Milch/Kuh (prod.)	8.298	7.906
kg Milch/ha (prod.)	7.128	8.099
kg ECM/ha (prod.)	7.455	8.048

Futterautarkie Vergleichszahlen (verk. Milch)

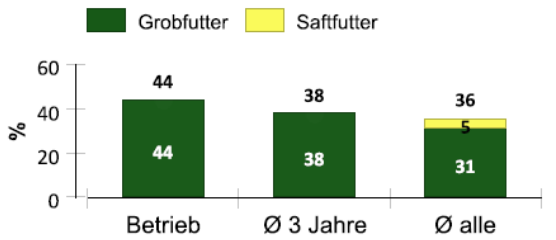
Trockensub.	Energie	XP-Tier	XP-Pflanze
80%	75%	54%	67%



Kraftfutterbereinigte Grundfutterleistung (prod. Milch)



Relative Grundfutterleistung (prod. Milch)

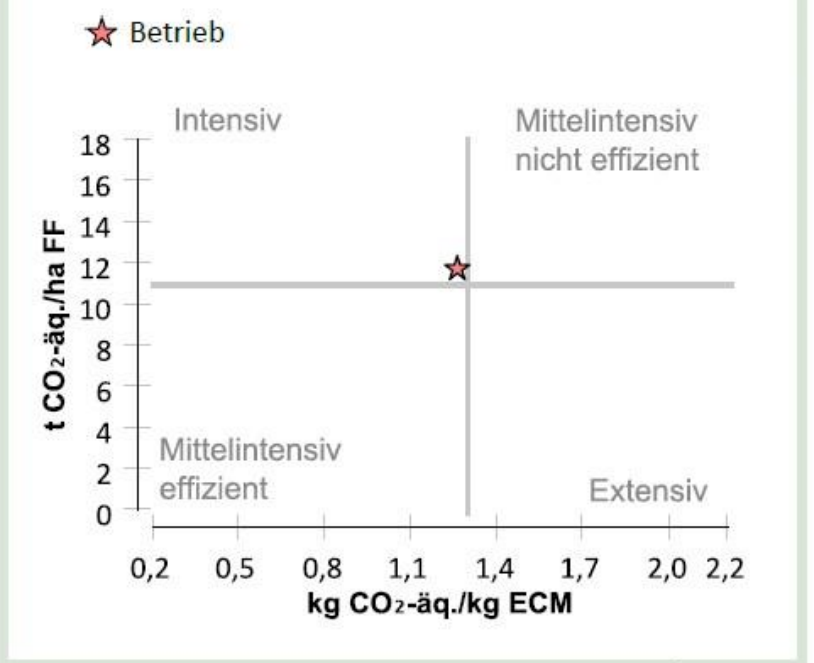


Verbrauch pro dt Milch (verk. Milch)	KF ges. dt	KF < 25 % XP dt	Eiweißkonz. dt	Strom kWh	Medikamente €	Wasser m³	Diesel l
Betrieb	0,28	0,20	0,08	7,73	1,52	0,55	1,63
Ø alle	0,34	0,26	0,08	6,57	1,03	0,38	2,32

Monitoring the Dairy Production

LCA-Daten Milchproduktion

Betriebspositionierung



	Betrieb	Ø alle
t CO_2-äq./ha FF	11,72	10,95
kg CO_2-äq./kg ECM	1,26	1,29

Monitoring the Dairy Production

Kennzahlen	Betrieb	Ø alle
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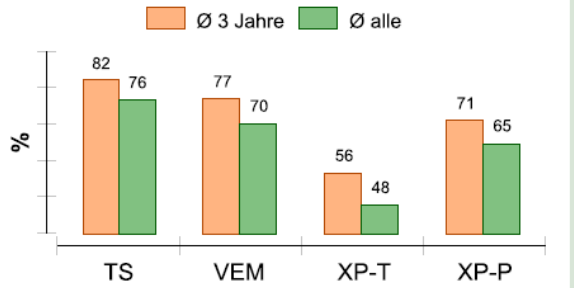

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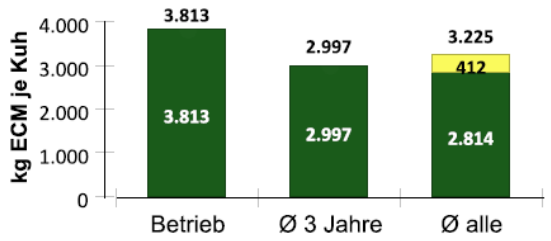

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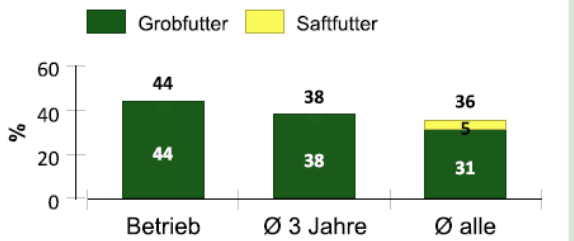

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1. XP-Tier

$$\boldsymbol{XP\_Tier}\ \% = \frac{XP\_needs - XP\_bought}{XP\_needs}$$

How much of the Crude-Protein that is converted into animal products comes from the farm itself.

Average all farms (n=129) in 2021: **48 %**

25 % Best Farms: **67 %**

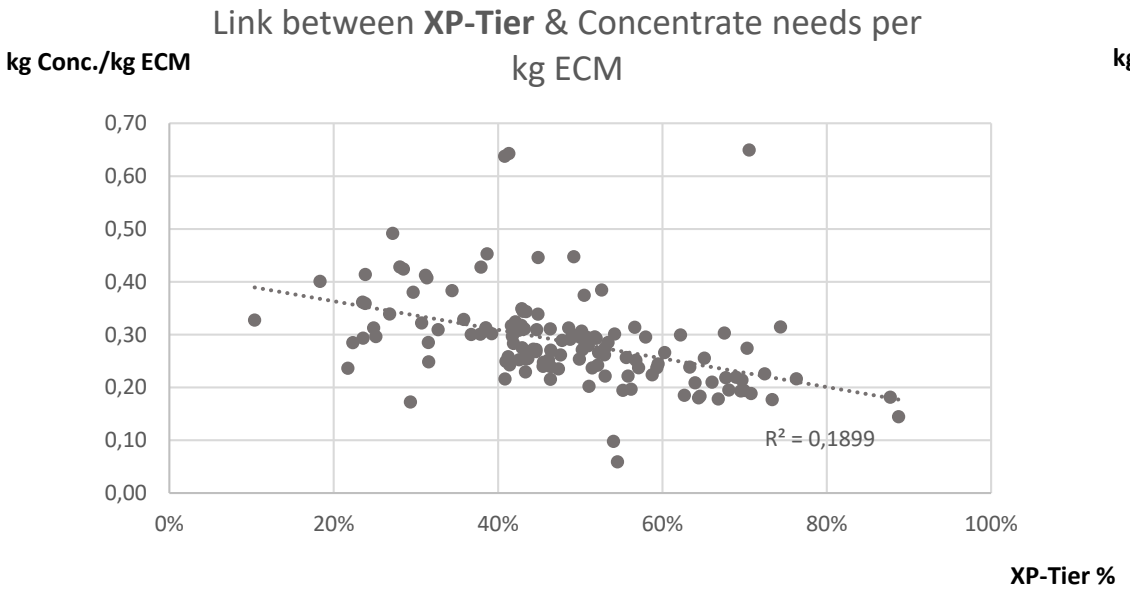
2. XP-Pflanze

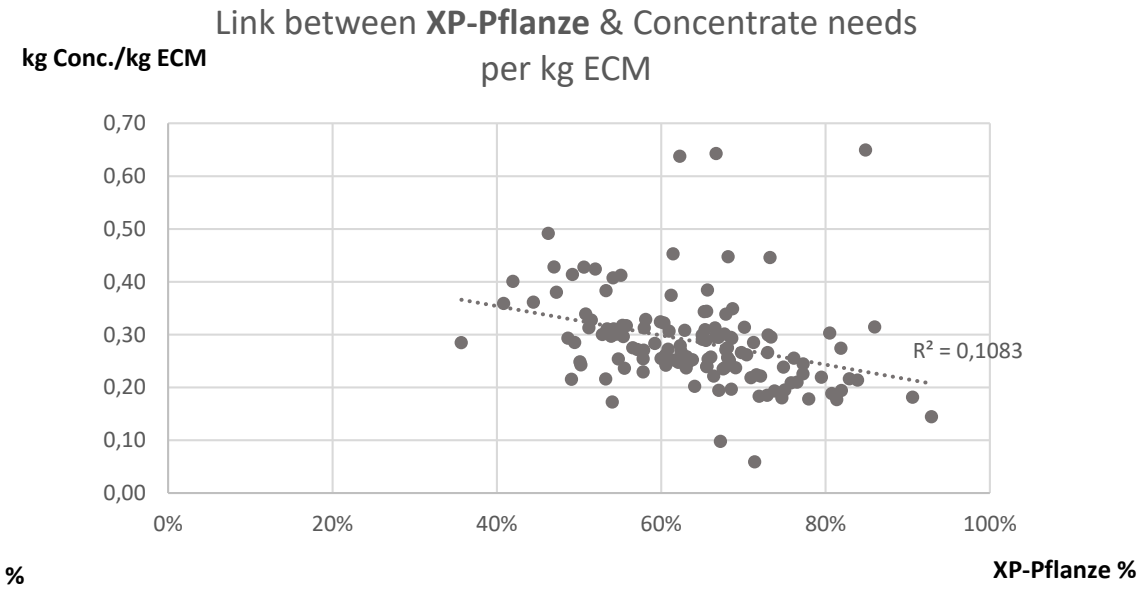
$$\boldsymbol{XP\_Pflanze}\ \% = \frac{XP\_produced\ on\ farm}{XP\_feeded}$$

How much of the feeded protein is produced by the farm itself.

Average all farms (n=129) in 2021: **64 %** **25 % Best Farms:** **78 %**

Concentrate needs



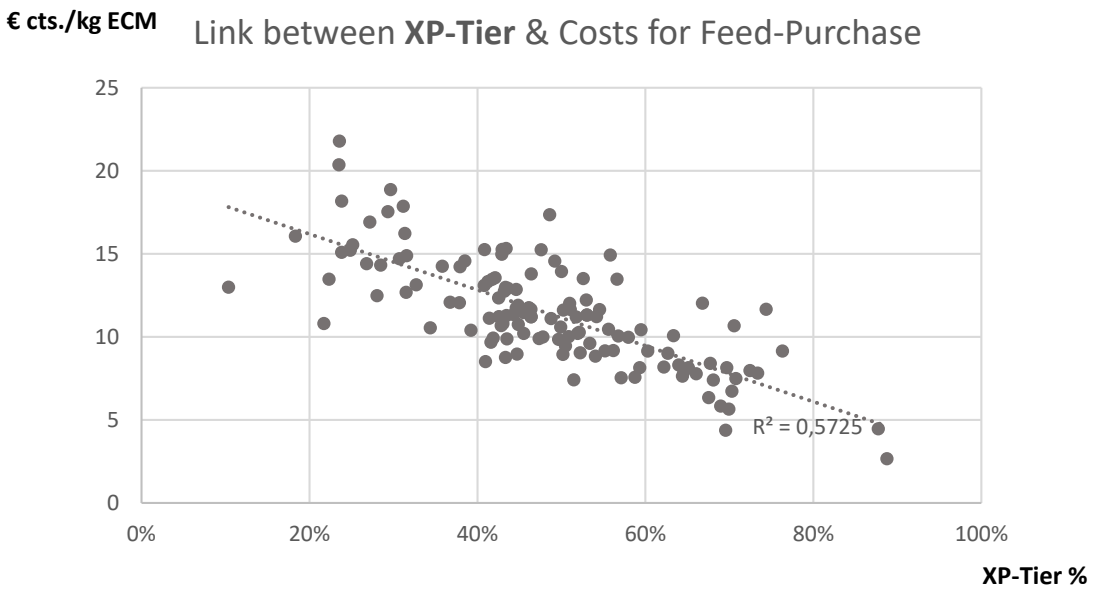


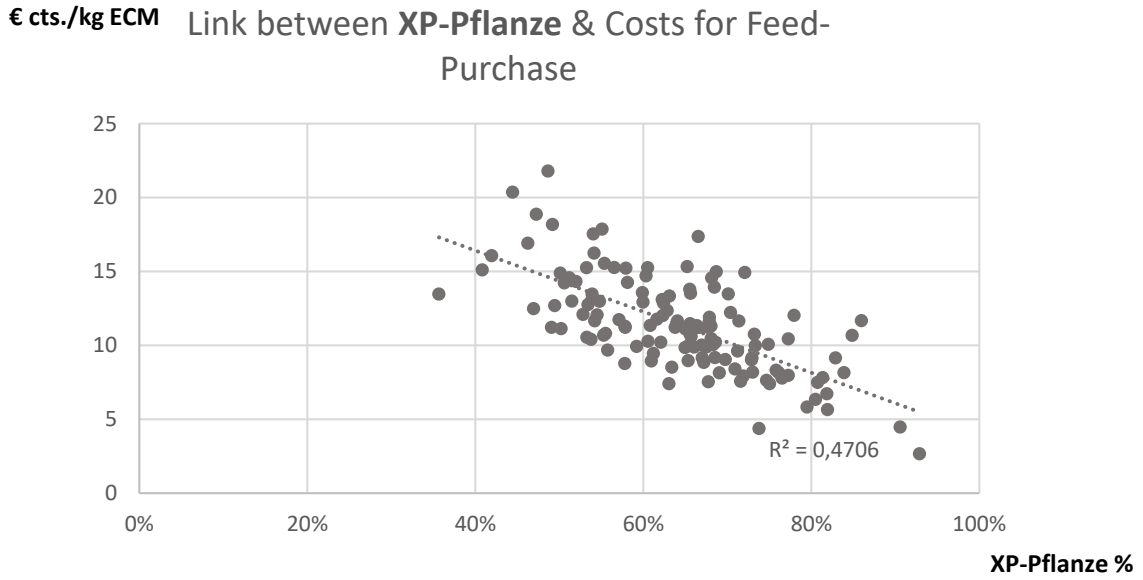
n = 129 farms

25 % best farms -16,7 % of concentrates per kg ECM

- 47 gramms / kg ECM

Costs for feed-purchase





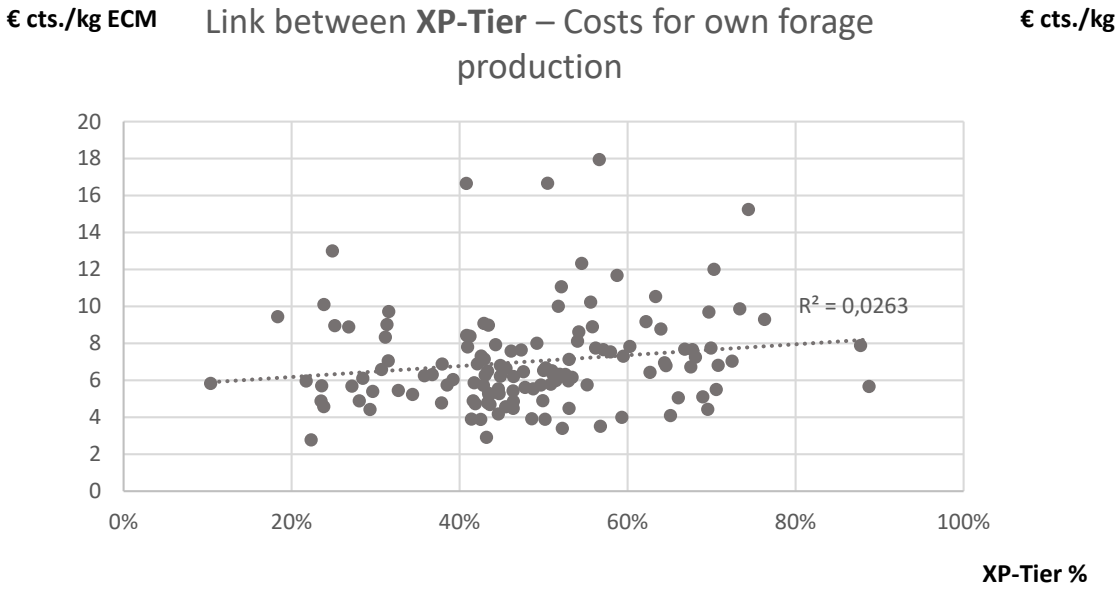
n = 129 farms

25 % best farms -30,1 % of costs for feed-purchase

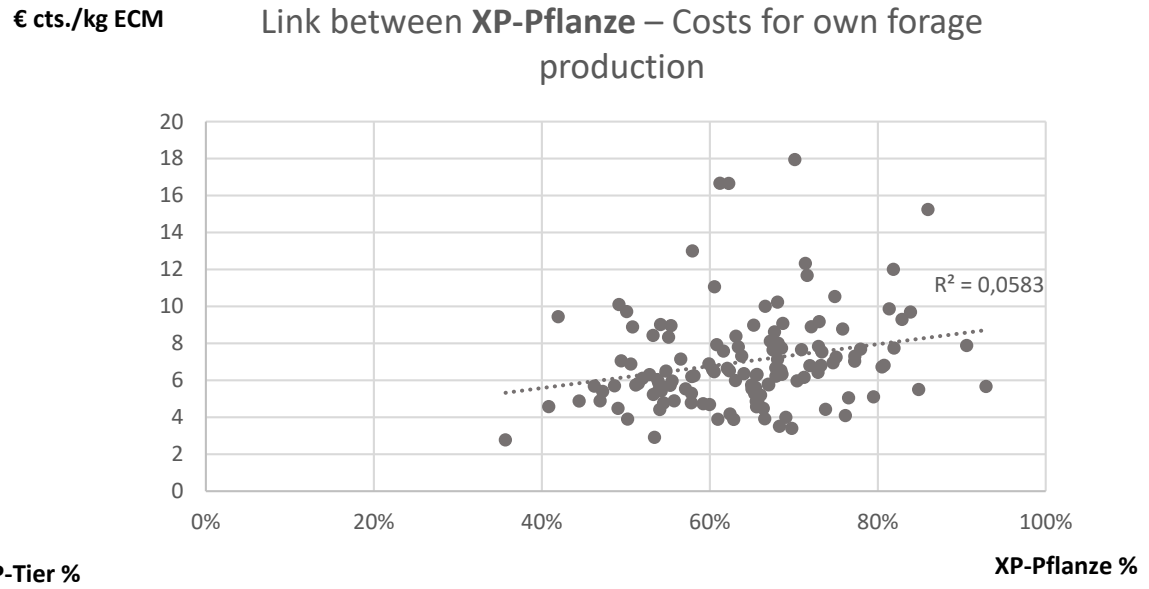
- 3,44 € cts. costs / kg ECM

Costs for own forage production

Link between **XP-Tier** – Costs for own forage production



Link between **XP-Pflanze** – Costs for own forage production

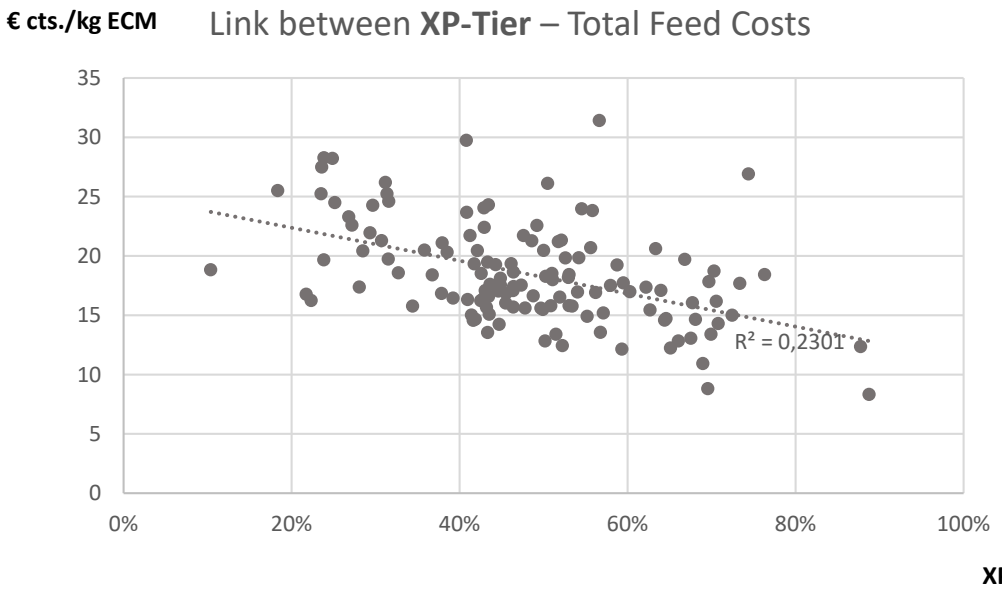


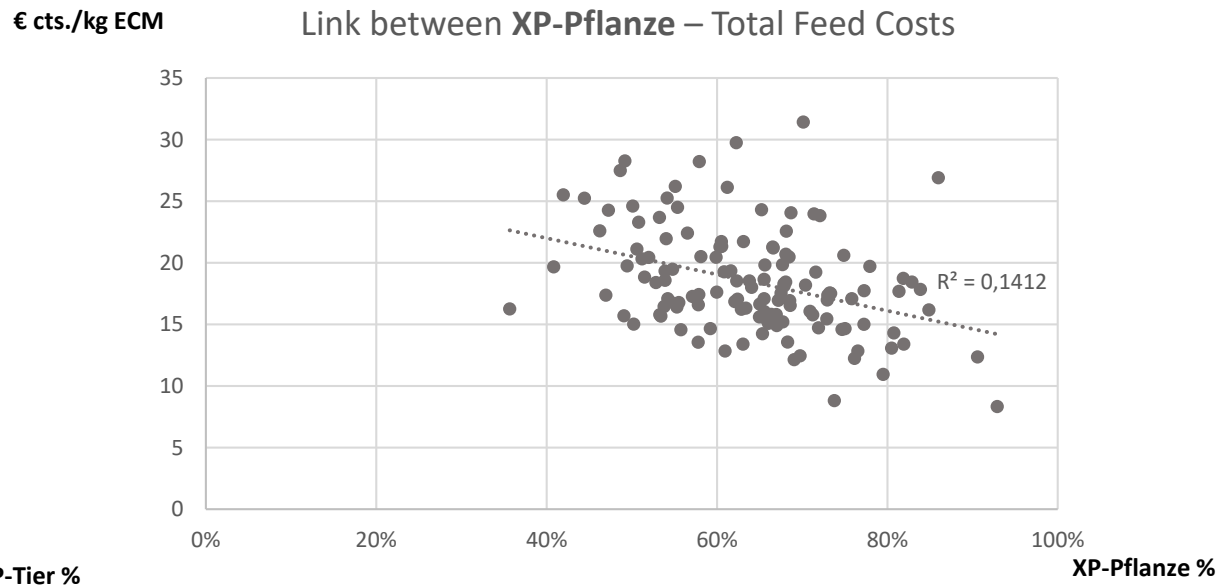
n = 129 farms

25 % best farms +11,1 % of costs for own forage production

-0,77 € cts. / kg ECM

Total Feed Costs



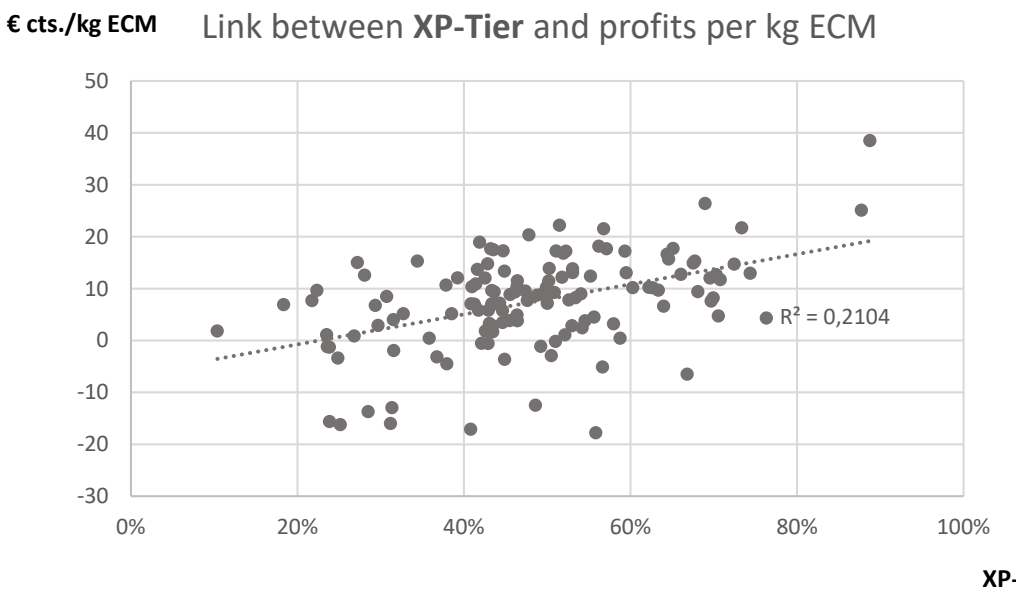


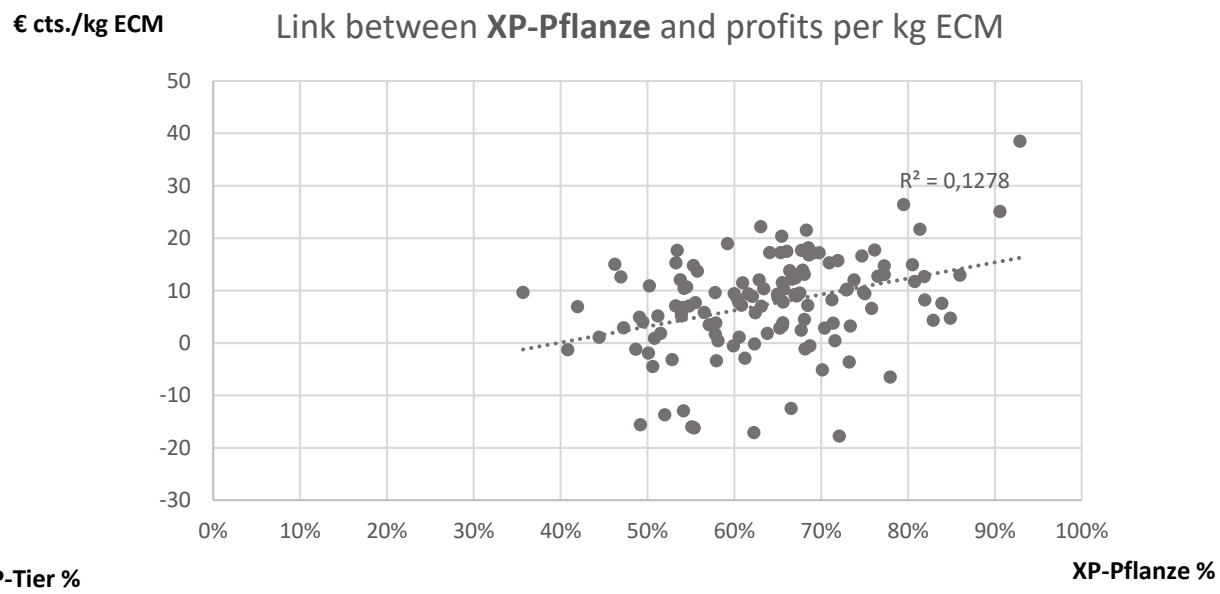
n = 129 farms

25 % best farms -14,5 % of total feed costs

- 2,67 cts. costs / kg ECM

Profits per kg ECM (incl. Subsidies)



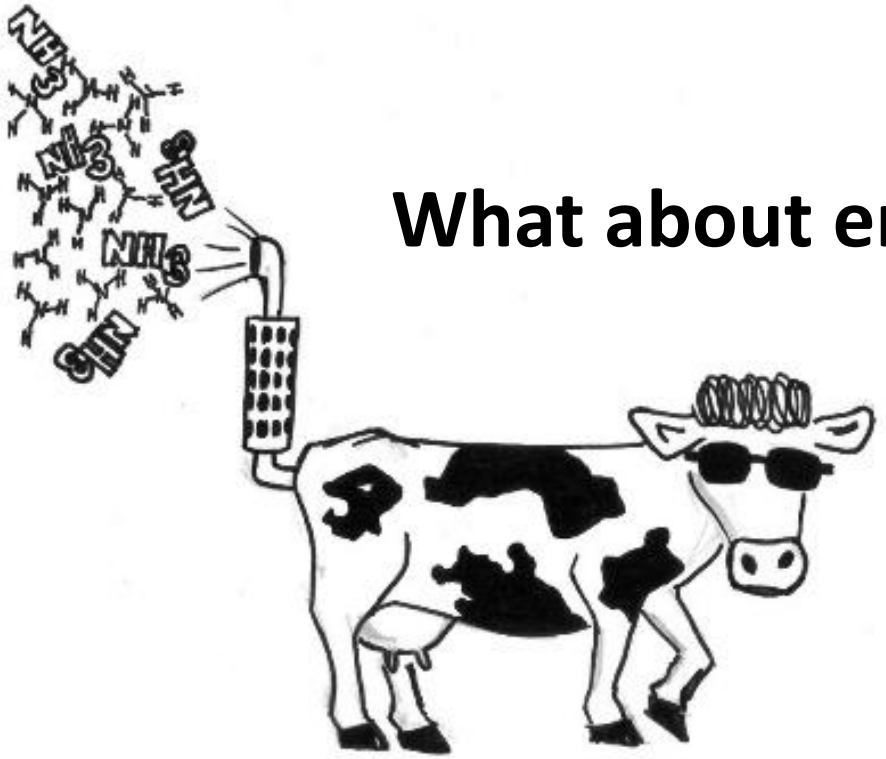


n = 129 farms

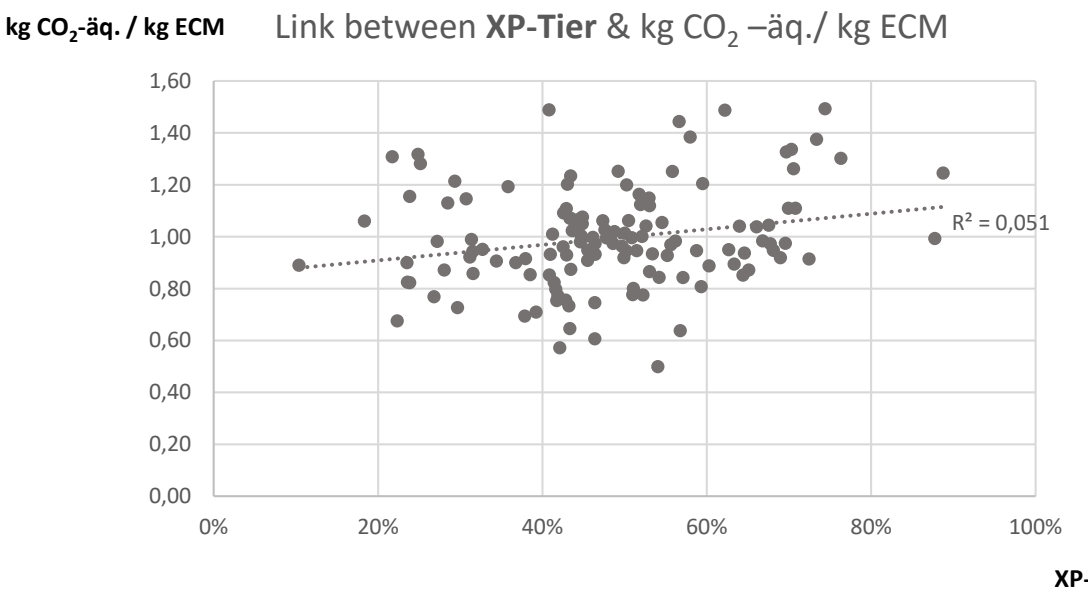
25 % best farms +80,7 % profit per kg ECM

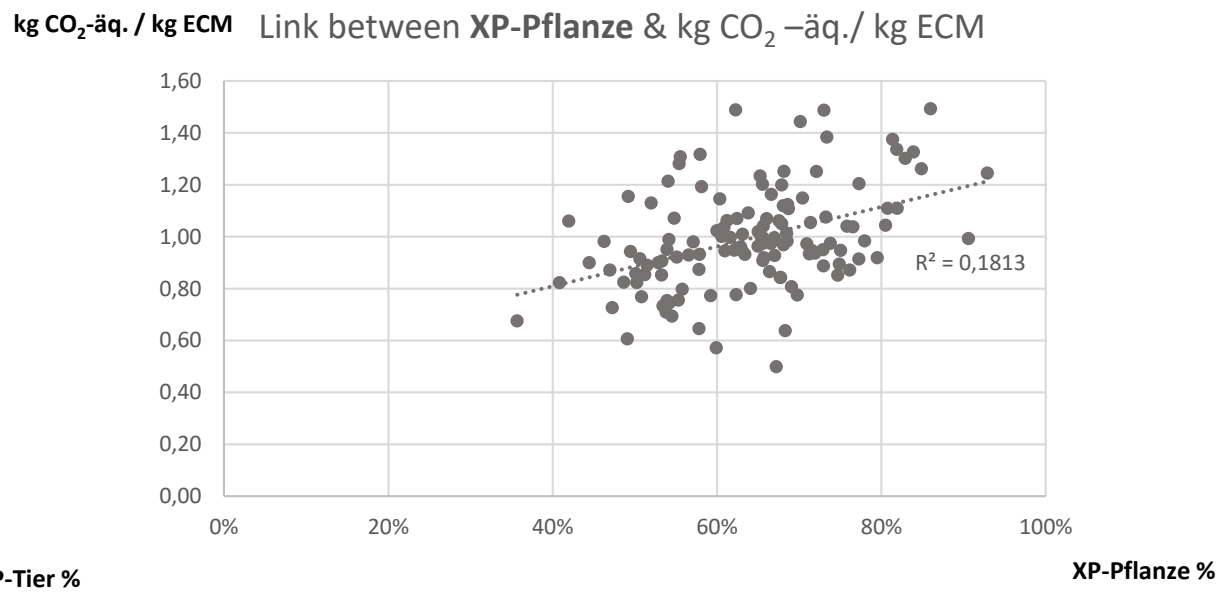
+ 5,77 cts. / kg ECM

What about environment?



CO_2-Emissions per kg ECM





n = 129 farms

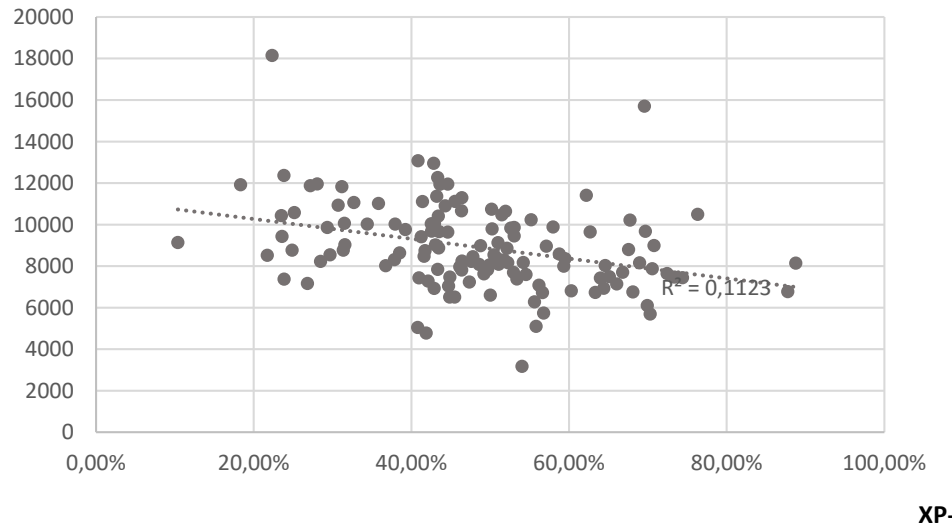
25 % best farms +8,4 % CO_2 emissions per kg ECM

+ 0,08 kg CO_2 -äq/ kg ECM

CO_2-Emissions per ha

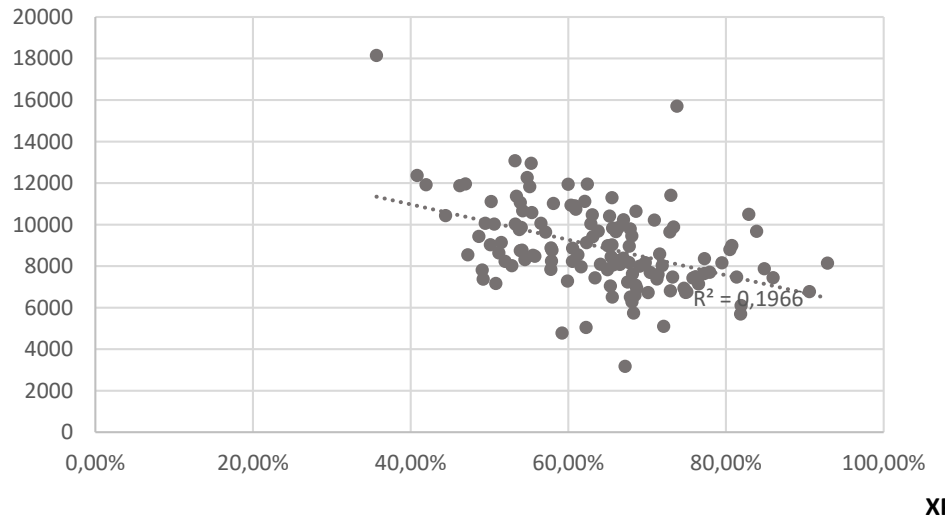
kg CO_2-äq. / kg ECM

Link between **XP-Tier** & kg CO_2 –äq. / ha



kg CO_2-äq. / kg ECM

Link between **XP-Pflanze** & tonnes CO2 –äq. / ha

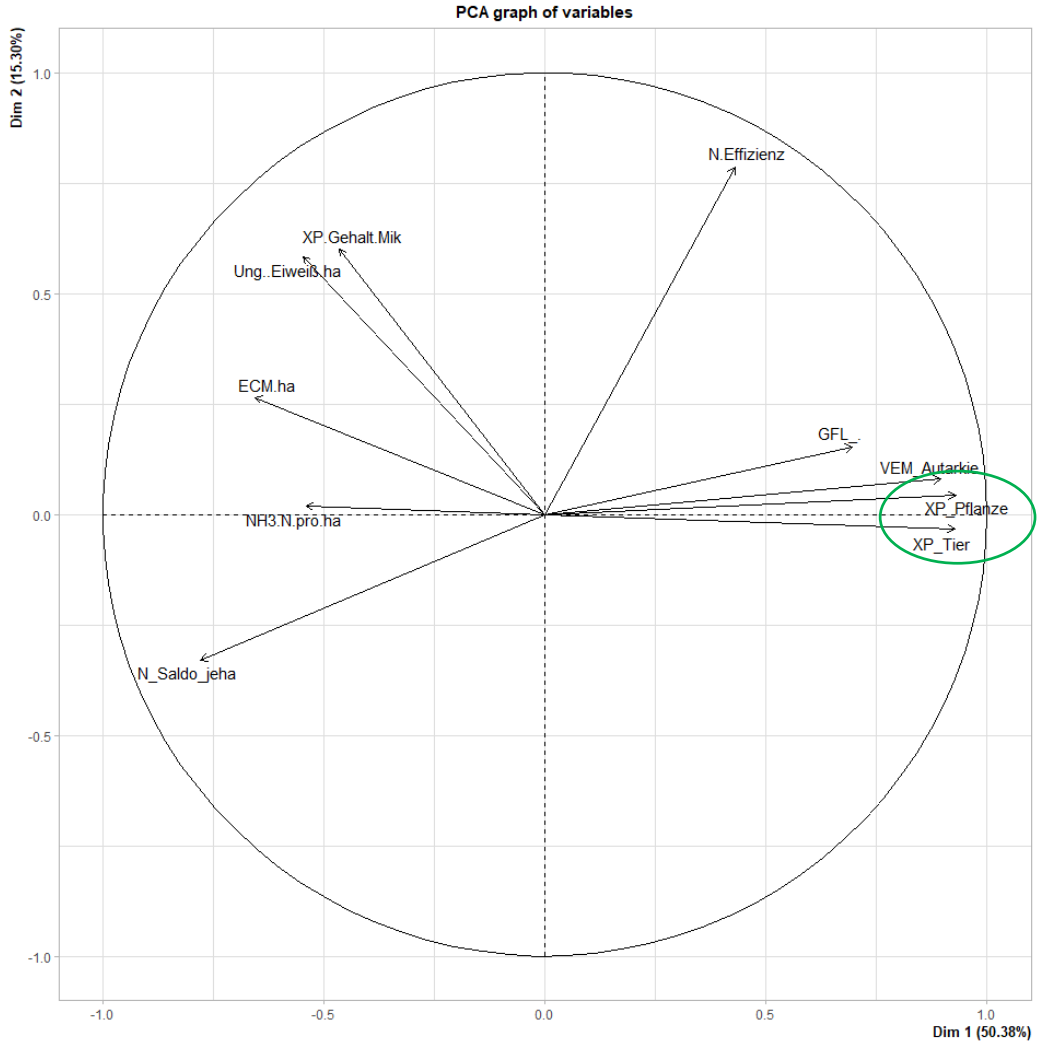


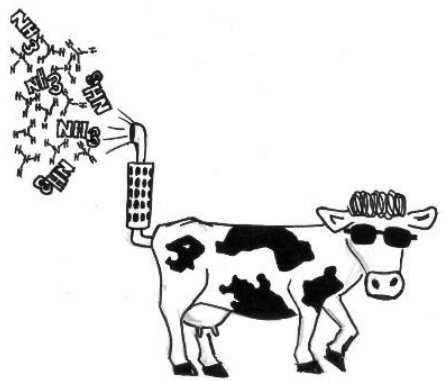
n = 129 farms

25 % best farms -7,2 % CO_2 emissions per ha

- 647 kg CO_2 -äq/ kg ha

Effects of Protein Self-Sufficiency on Ammonia Emissions





What are the best farms doing better?

What are the best farms doing better?

Best **forage quality** through
- Grassward management
- Mowing time
- Conservation management
- Fermentation quality

Precision in **feeding**
- Well equilibrated rations
- no luxury consumption
- Correct complementation
- Reducing Protein-Content

Herdmanagement
- Age at first calving
- Lifetime-production
- Dry-Cow Management

Grazing
- High protein amount
- High protein quality
- Low protein losses
- Possibilty of Seasonal Calving

Herd Health
- lameness
- Fertility
- Parasite infection
- General health

Producing own concentrates
- more independant from the markets
- Growing grainlegumes

Protein Self-Sufficiency

-

An indicator for Resilience in Dairy?

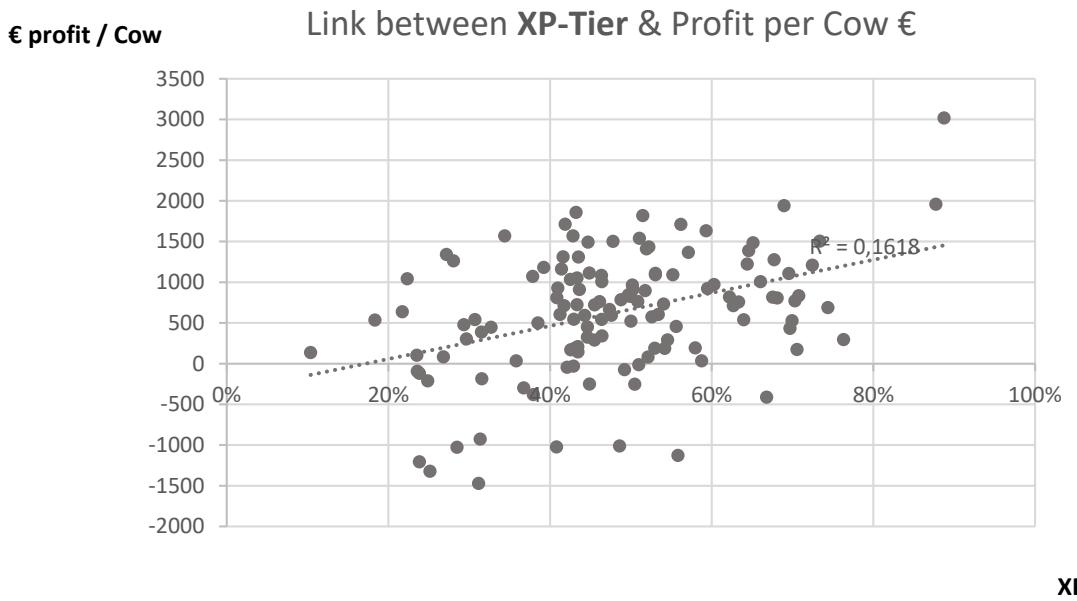
YES!

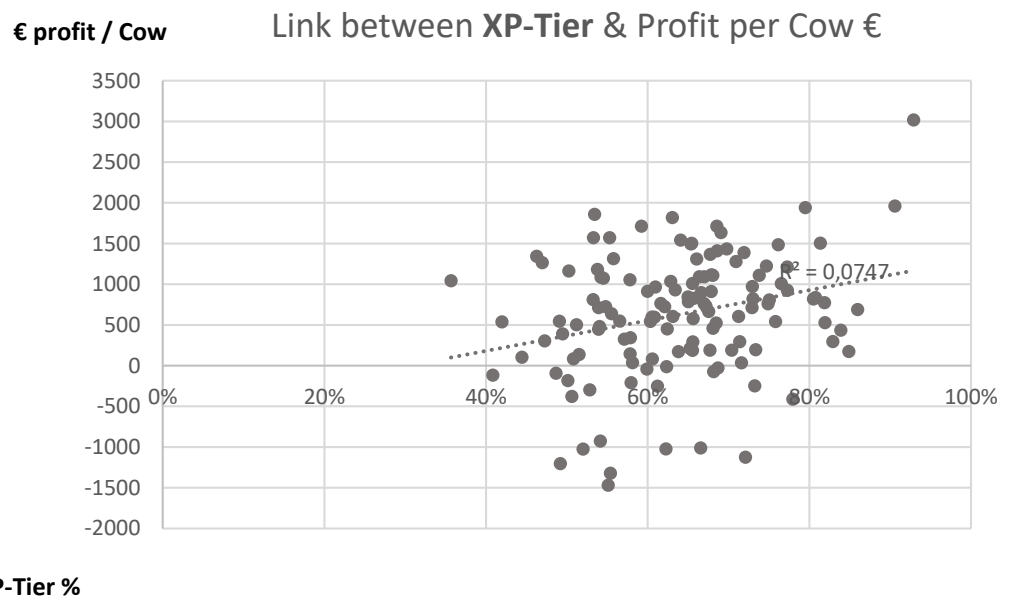
Summary of the main results of the 25 % best farms

Concentrate needs kg /kg ECM	-16,7 %	-47 gramm concentrates per kg ECM
Costs for feed-purchase € cts./kg ECM	-30,1 %	-3,44 € cts per kg ECM
Costs for own forage production € cts./kg ECM	+11,1 %	+0,77 € cts per kg ECM
Totat feed **costs** € cts./kg ECM	-14,5 %	-2,67 € cts. per kg ECM
Profit incl. Subsidies € cts./kg ECM	+80,77 %	+5,77 € cts. per kg ECM
CO2 -Emissions per kg ECM	+8,4 %	+0,08 kg CO2 – äq. per kg ECM
CO2-Emissions per ha	-7,2 %	- 647 kg CO2-äq. per ha

**Additional slide

Profit per cow (with subsidies)





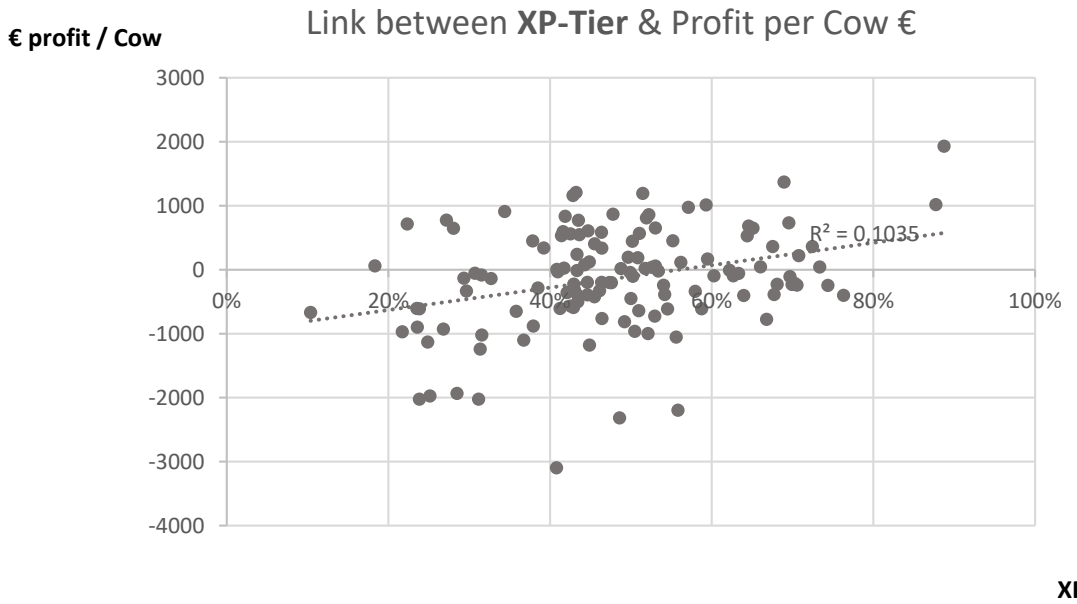
n = 129 farms

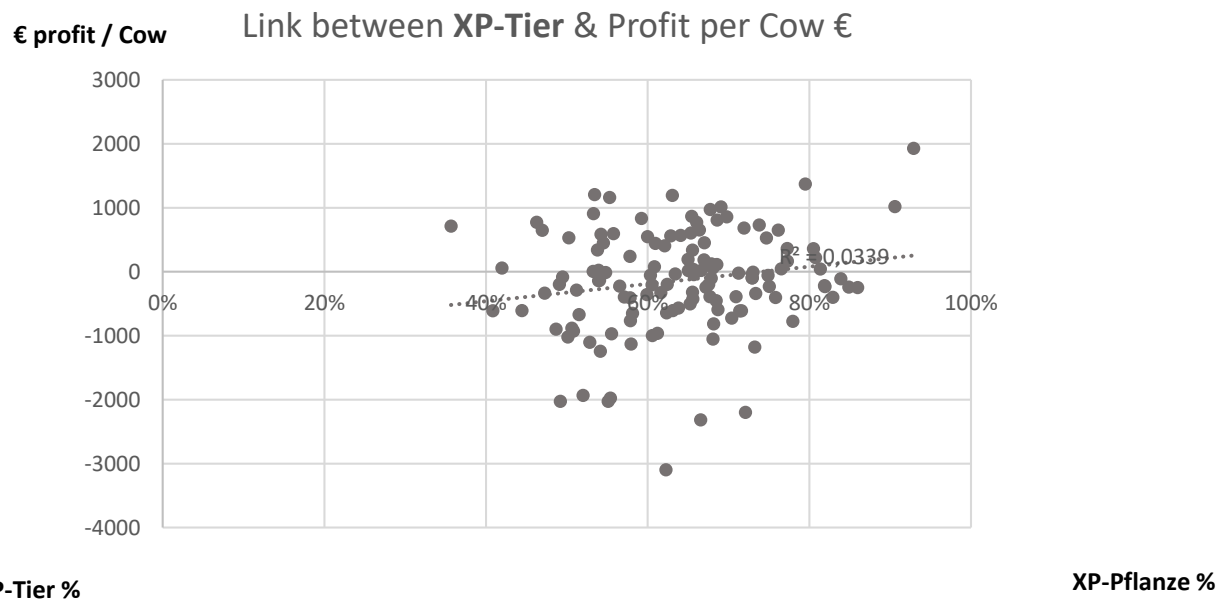
25 % best farms +57,6 % more profit per Cow (with subsidies)

+ 362 € per Cow

**Additional slide

Profit per cow (without subsidies)





n = 129 farms

25 % best farms +230,9 % more profit per cow (without subsidies)

+316 € per Cow

Thank you very much for your attention!