



**MS, PG,
27. February, 2024**

**SUCCESSFUL SILAGE MAKING:
LESSONS LEARNED WITH THE
SANO - LABORATORY**

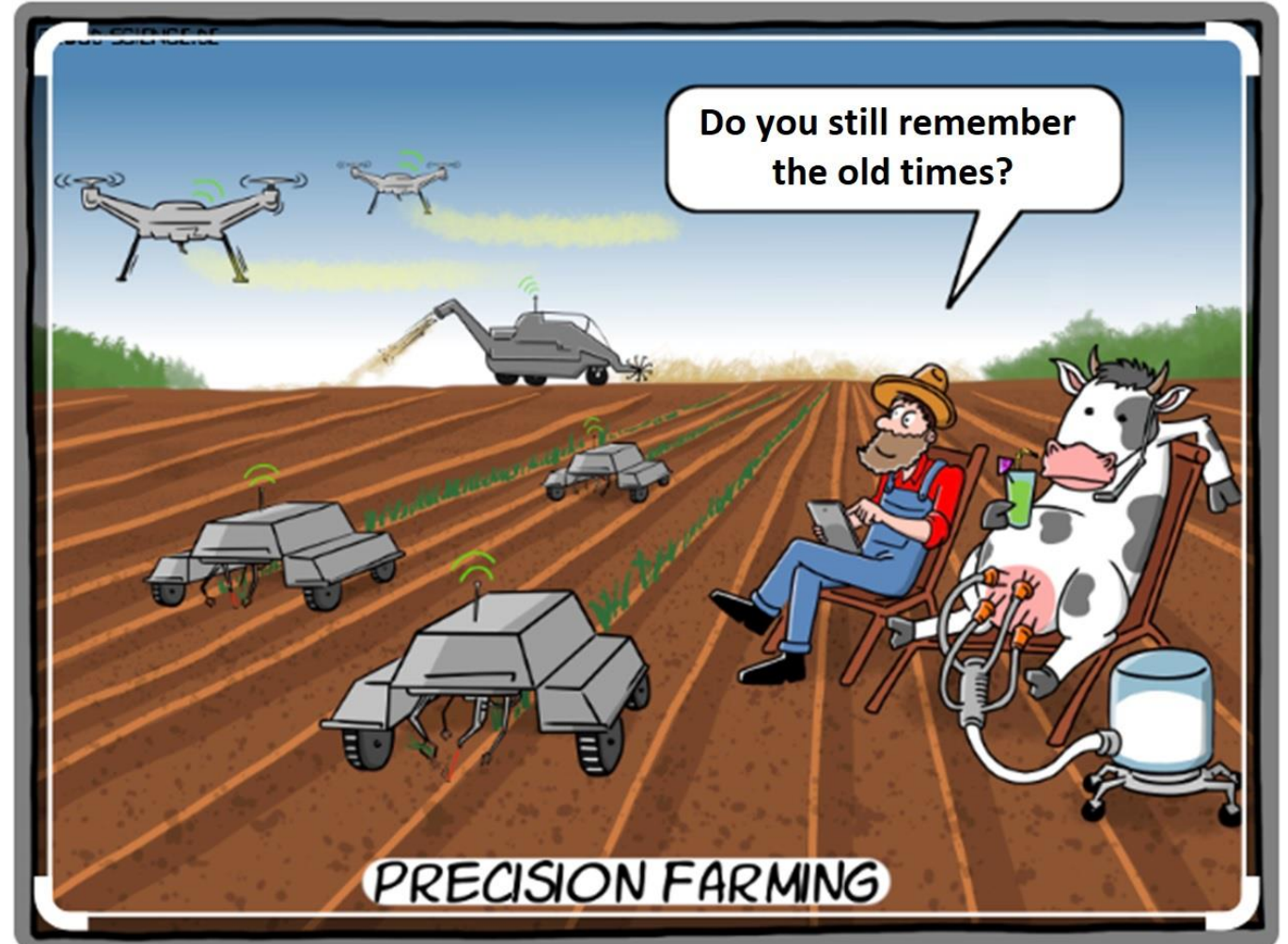




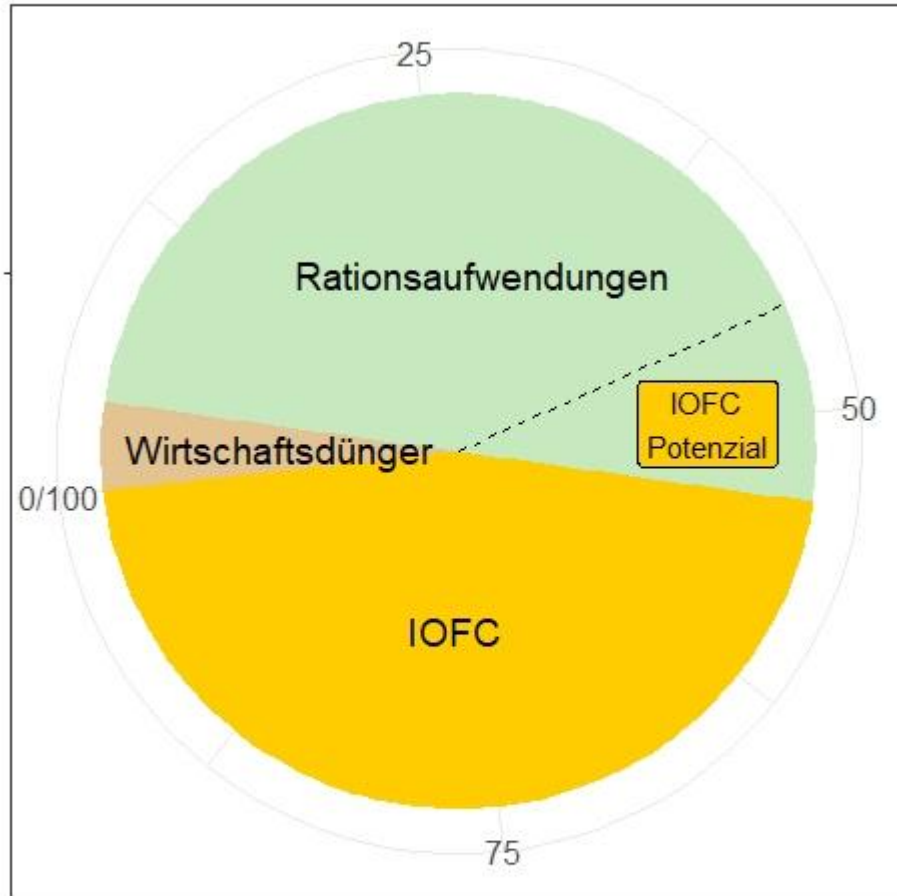
Dr. Manfred Schönleben
Ruminant Nutrition Expert

ECONOMIC SUSTAINABILITY

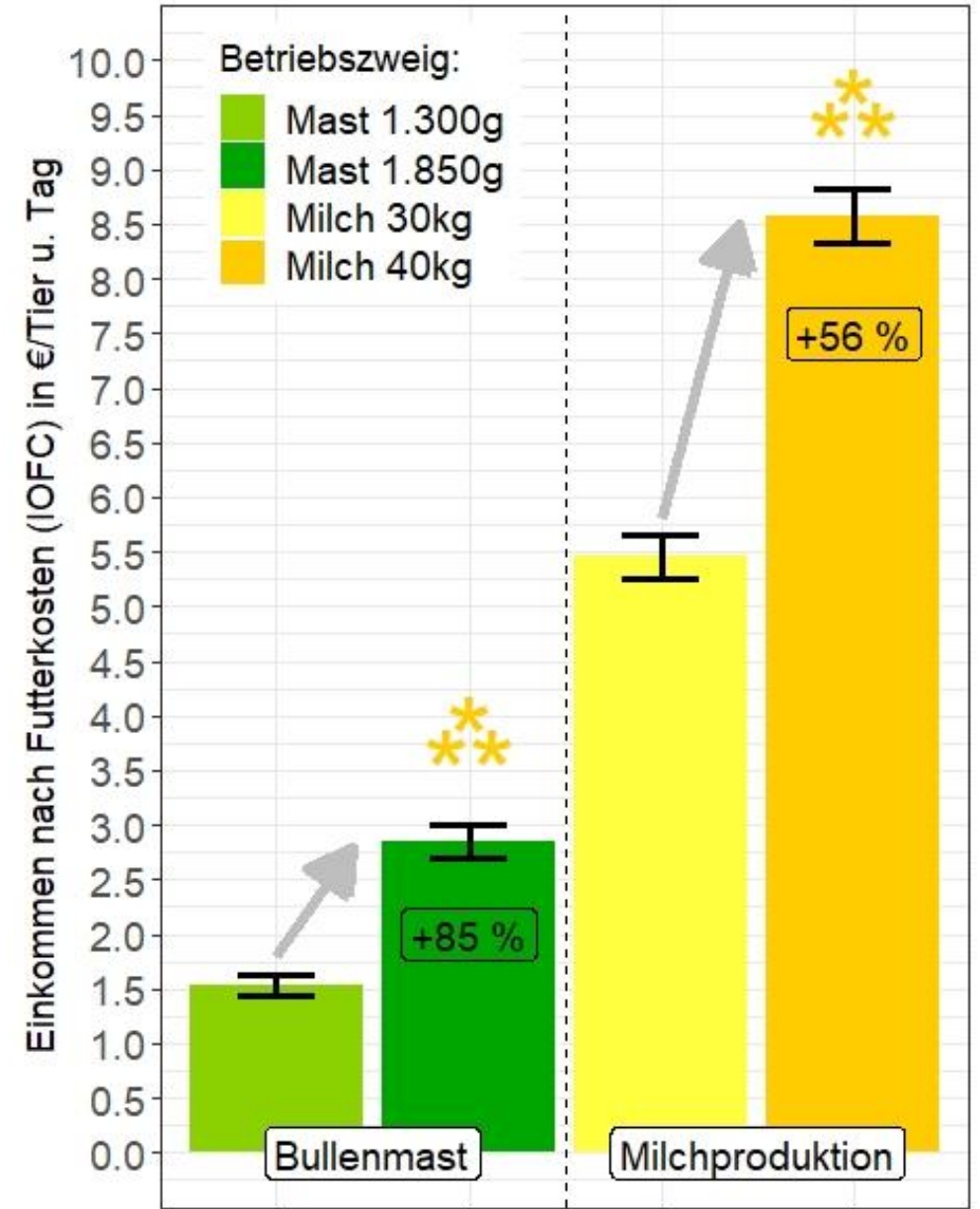
- How to farm economically sustainable, and also in highly volatile price phases?
- Own-grown feed/silage with optimal nutrient profile:
-> **The cornerstone of success**



INCOME AFTER FEED COSTS (IOFC)



Betriebszweige Bullenmast / Milchproduktion:
Zusammensetzung der monetären Marktleistung (%)



Vergleich typischer IOFC
Betriebszweigergebnisse

USE OF NUTRIENTS

DIETARY

COMPOSITION:

- **Fiber components:**

30%-35%

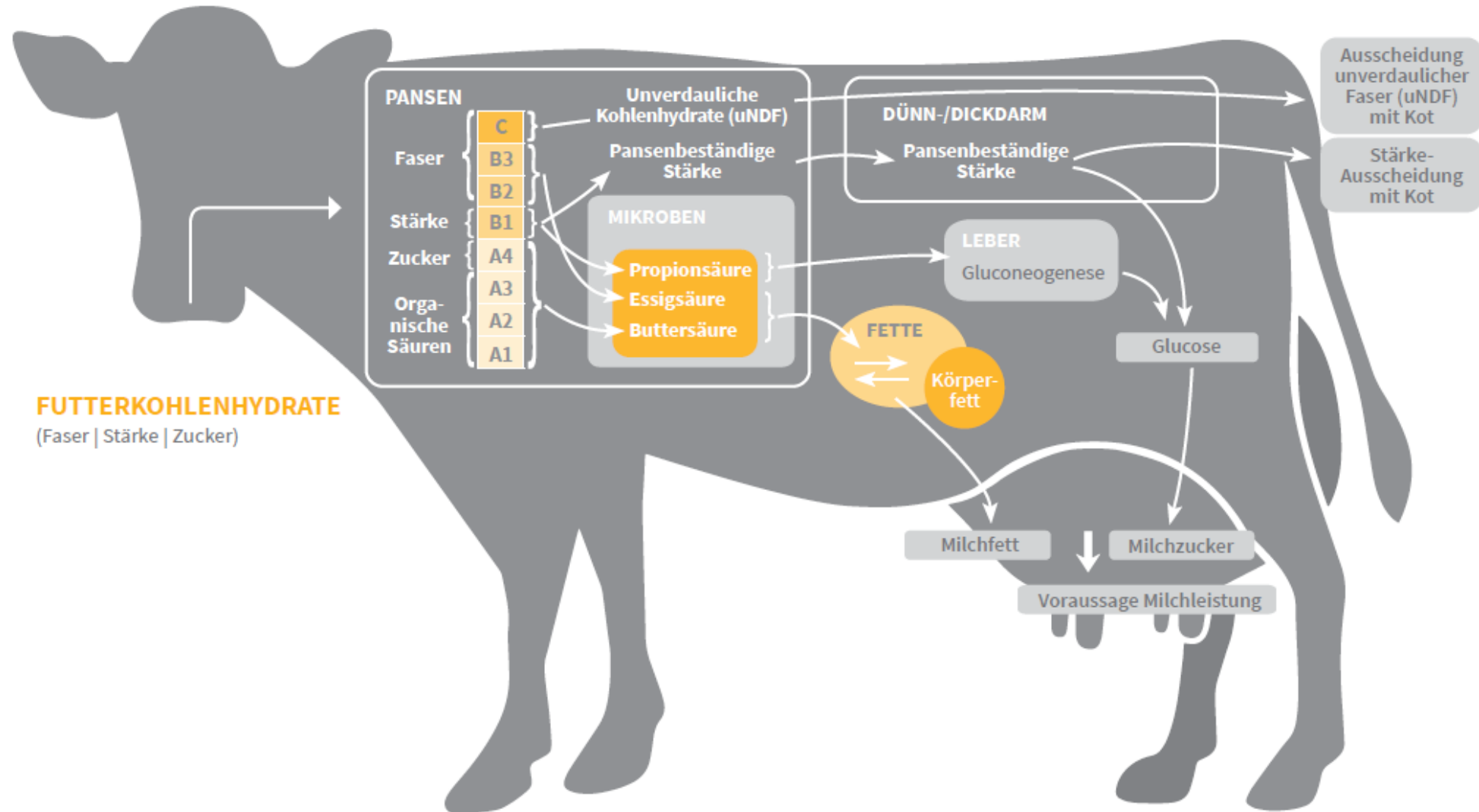
- **Starch: 25%-30%.**

- **Sugar: 5%-8%.**

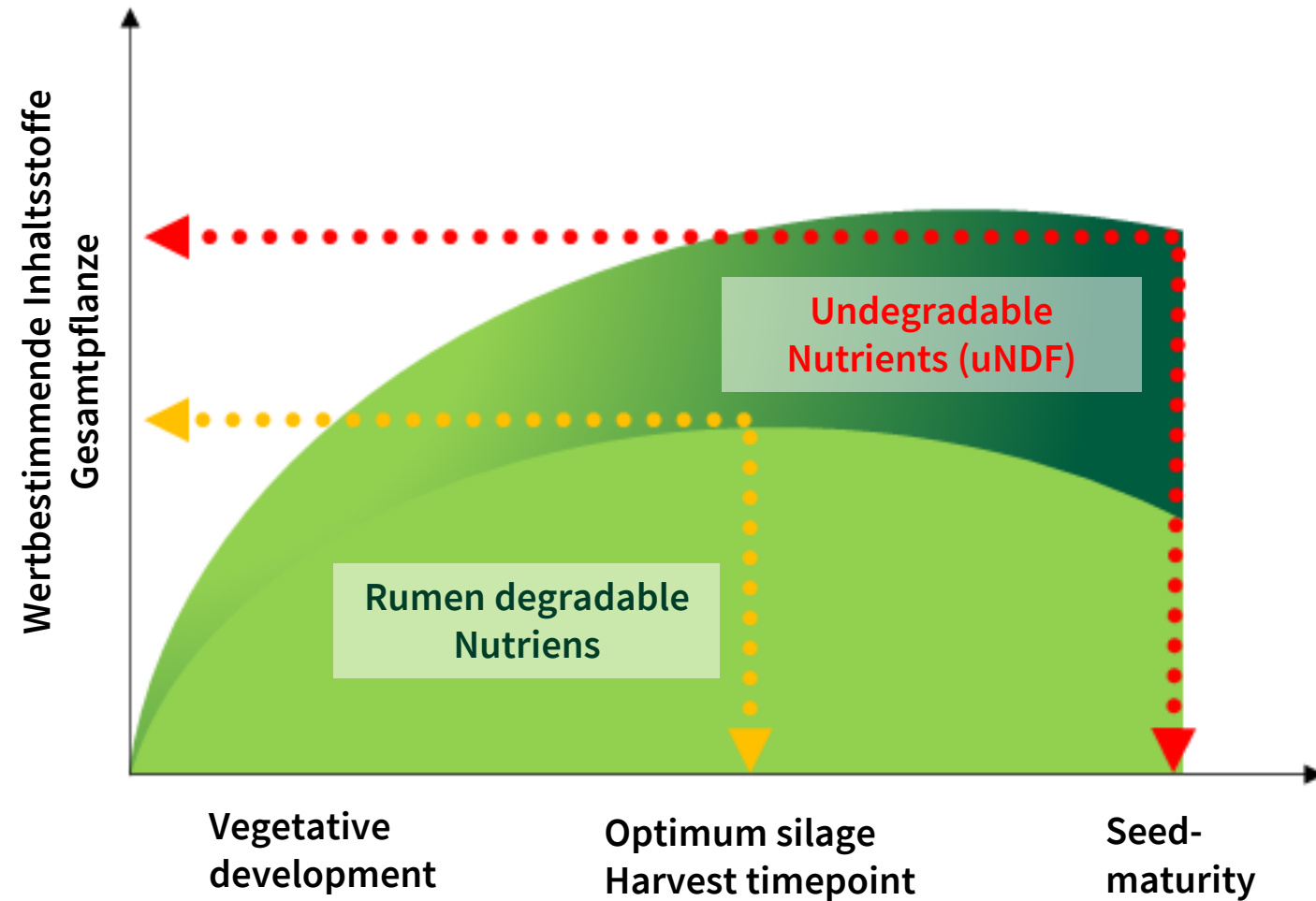
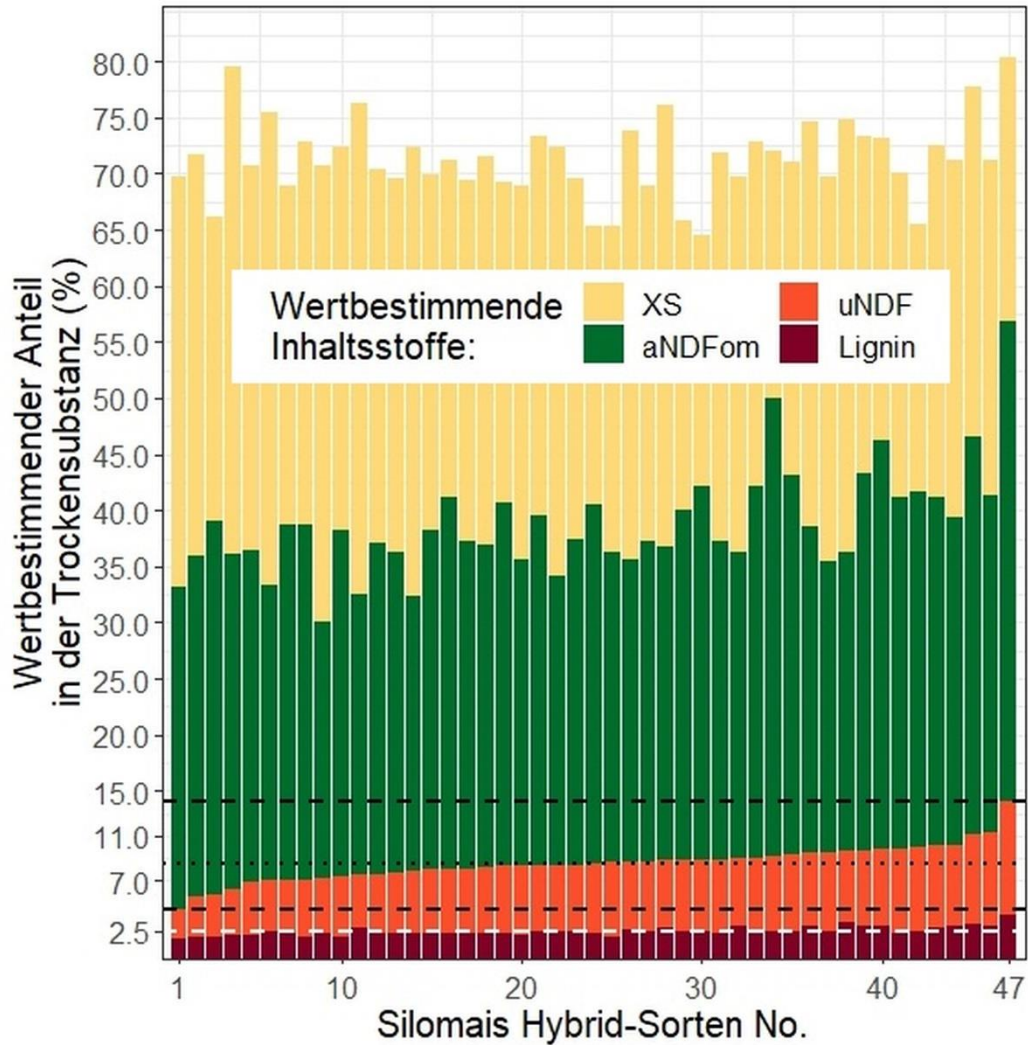
- **Proteins: 15%-18%.**

- **Fat: 3%-7%.**

- **Minerals: 6%-8%.**



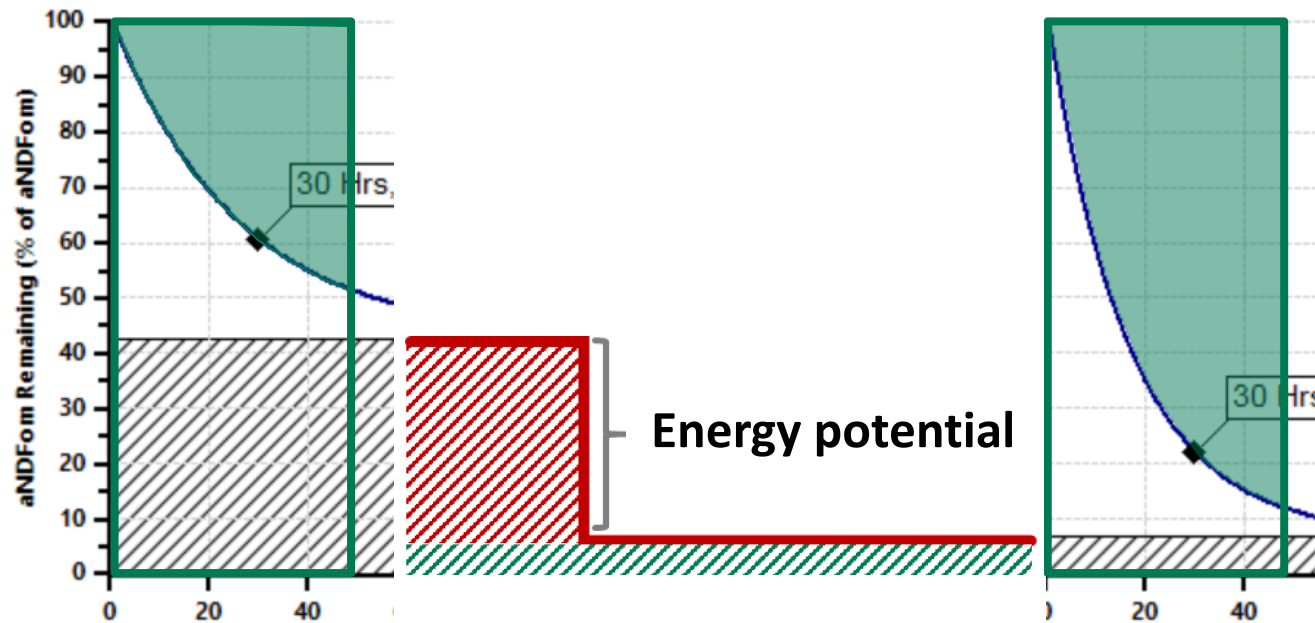
VALUE-DETERMINING YIELD FORMATION



(modified after DMK. 2013; Sano 2021)

UNDERSTANDING FIBER RUMEN DEGRADATION

aNDFom Verdaulichkeit



SUBOPTIMAL FIBER DIGESTIBILITY:

- Low amount of digestible NDF, poor feed intake and low milk yield
- High amount of undigestible fiber (uNDF)

EXCELLENT FIBER DIGESTIBILITY:

- High proportion of digestible NDF, high feed intake and high milk production

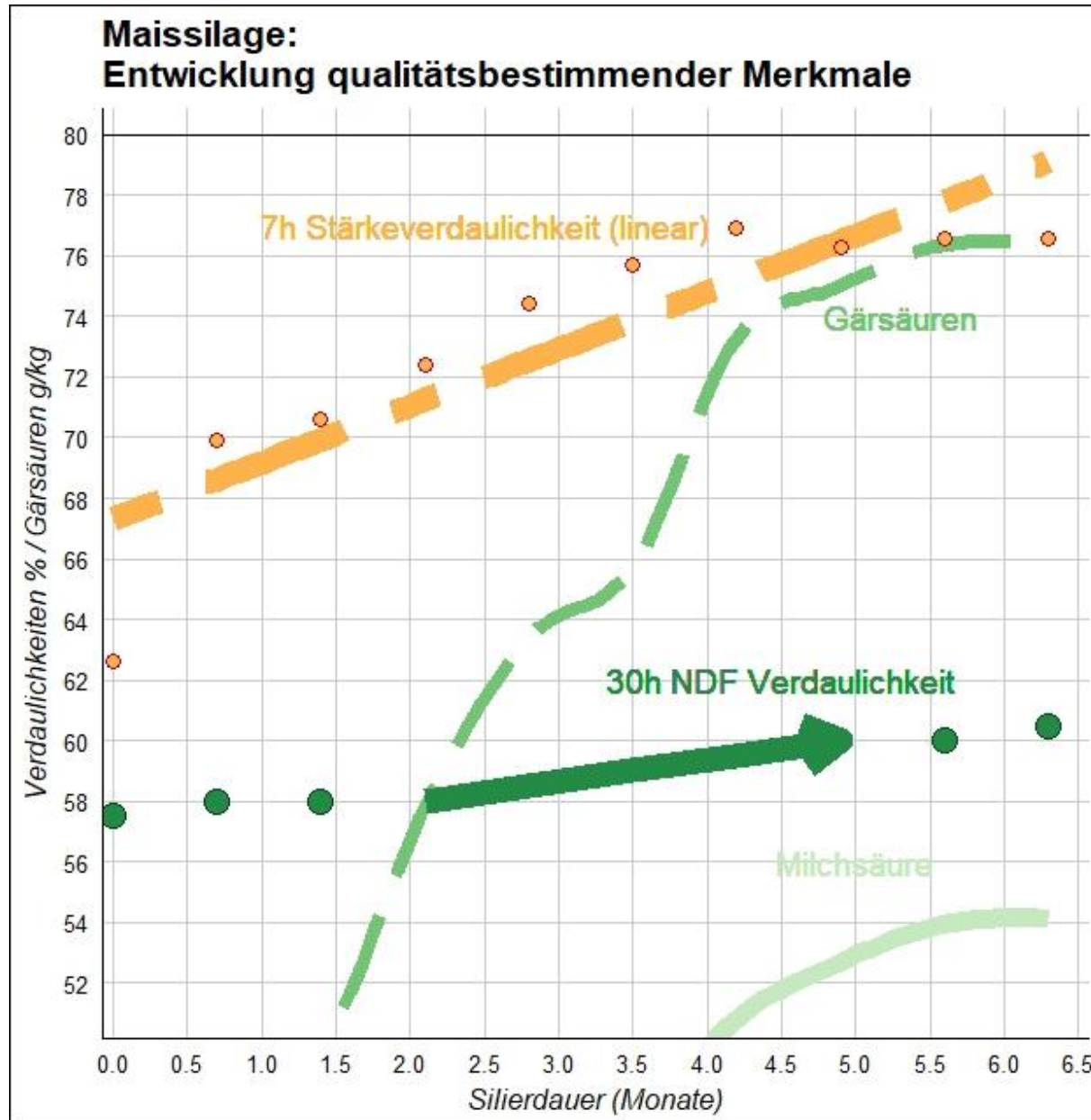
- A **1%-point increase** in NDF digestibility after 30 hours corresponds to an **additional daily milk yield of 0.2 kg**,
- or **20g higher average daily gain** in bull fattening.
- **Know the uNDF of your feeds!**

(OBA u. ALLEN 1999)

SANO LABORATORY



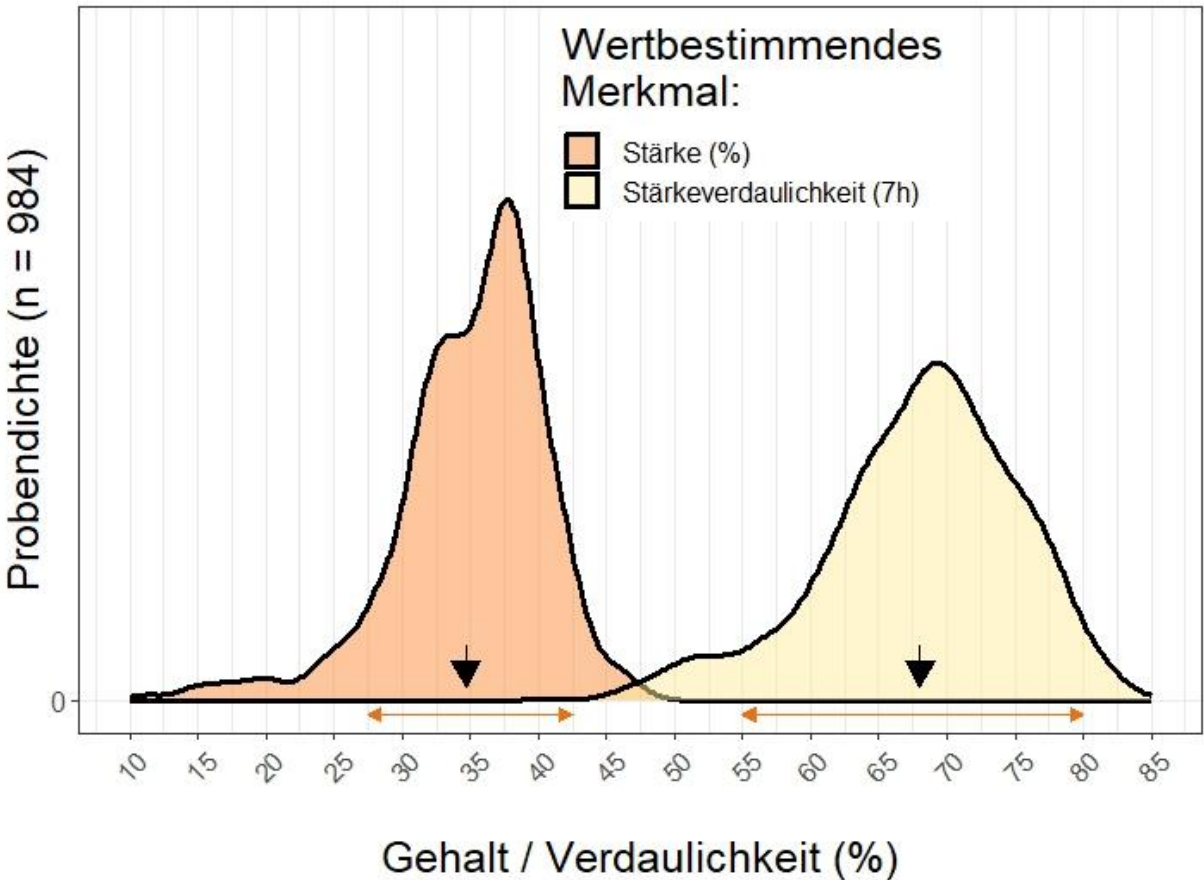
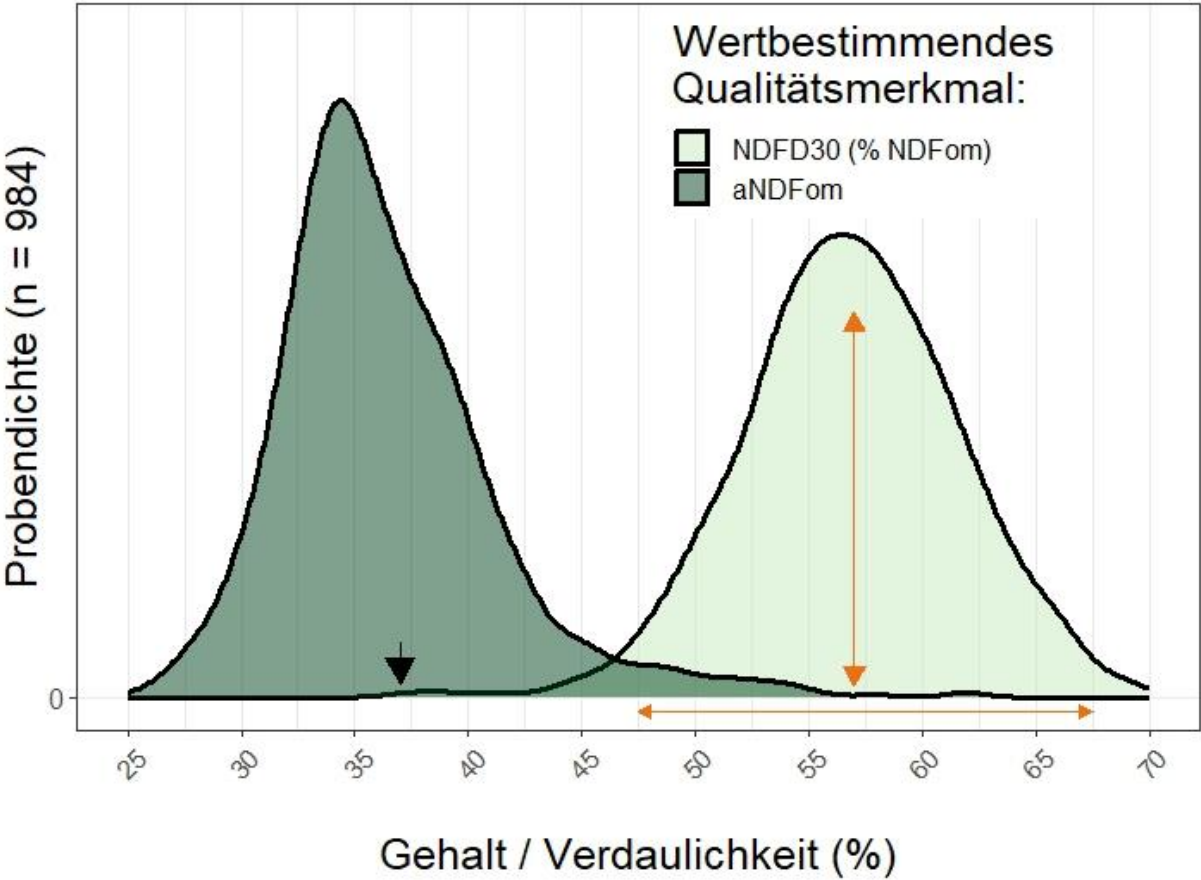
UNDERSTANDING SILAGE QUALITY



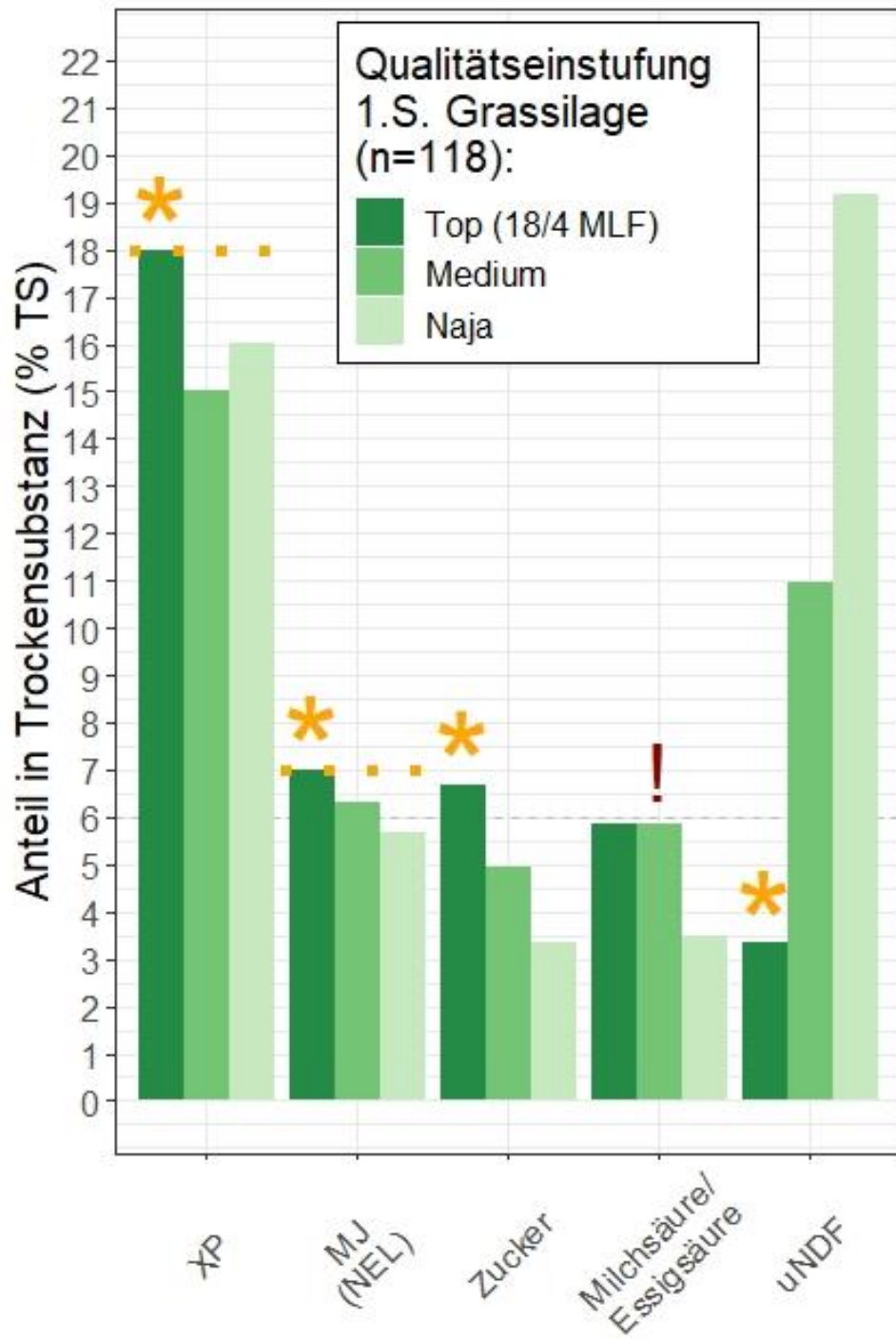
PILLARS OF SILAGE QUALITY:

- **Harvest date** (nutrient composition + nutrient digestibility + drymatter content)
- **Variety choice(s)** (harvest window and uNDF)
- **Chopping quality**
- **Ensiling management** (inoculation, fermentation acid pattern, fermentation duration, ground trafficability)
- **Silage bunk management** (filling duration, compaction, removal/feed-out)

HARVEST QUALITIES 2023 (03.12.2023)



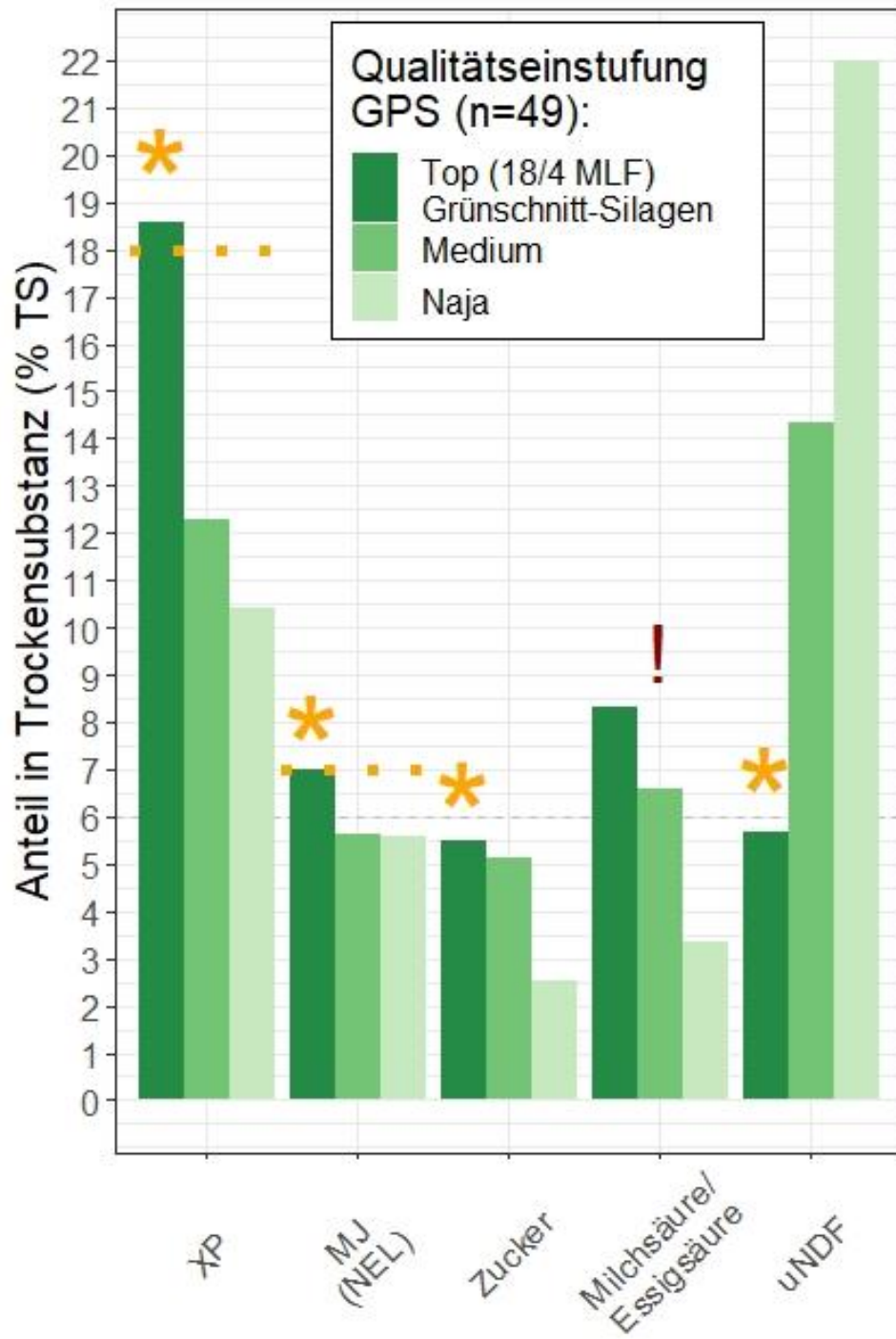
GRAS SILAGE 1. CUT



- **High variability of 1. cut qualities**
- **Optimum harvest date** ca. 4 – 7 weeks after start of vegetation, or end of April – first week of Mai
- **Typically, very high drymatter and digestible yield potential**
- **Period with many workload peaks** (seeding maize), or longer bad-weather phases (2023)
- Typically, **two precipitation-free days in a row are needed**



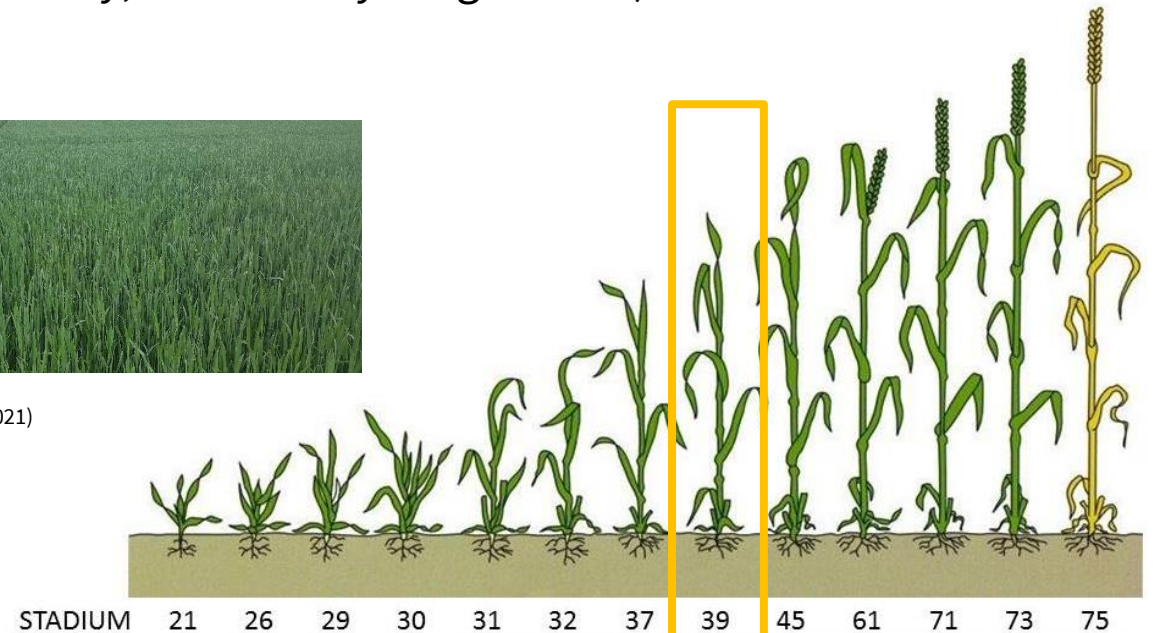
GREEN-CHOP-SILAGE



- **Wilted silage from cereals**
- Crops (triticale, rye, etc.)
- **Optimum harvest date (EC 39).**
- **Goal: Maximizing digestible yield**, e.g. fiber digestibility and energy density (typically, followed by silage maize)



(Sano - Consulting 2021)



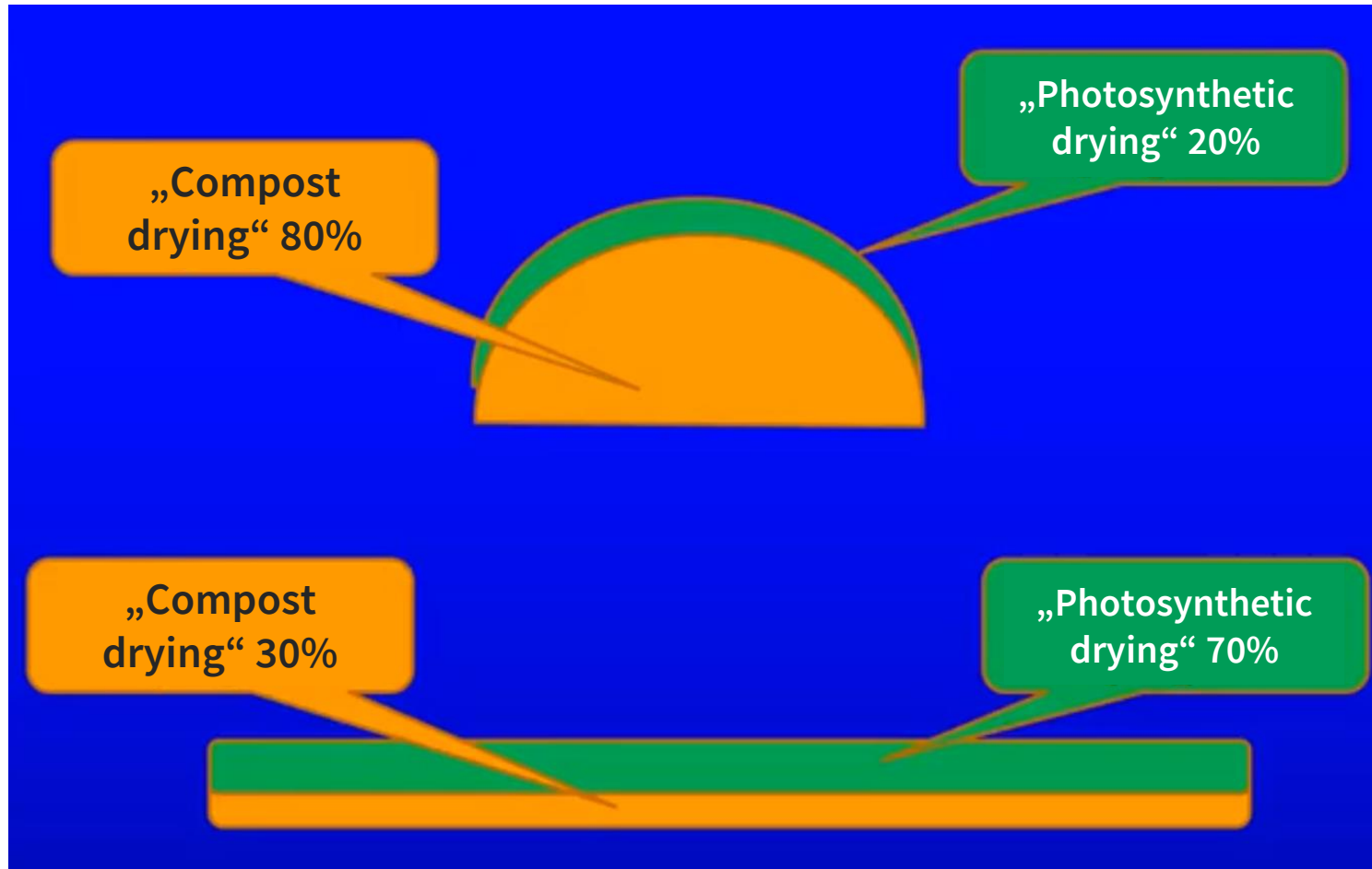
SAME-DAY SILAGE:

Kohlenstoffdioxid + **Wasser**

Sonnenlicht

Zucker + Sauerstoff

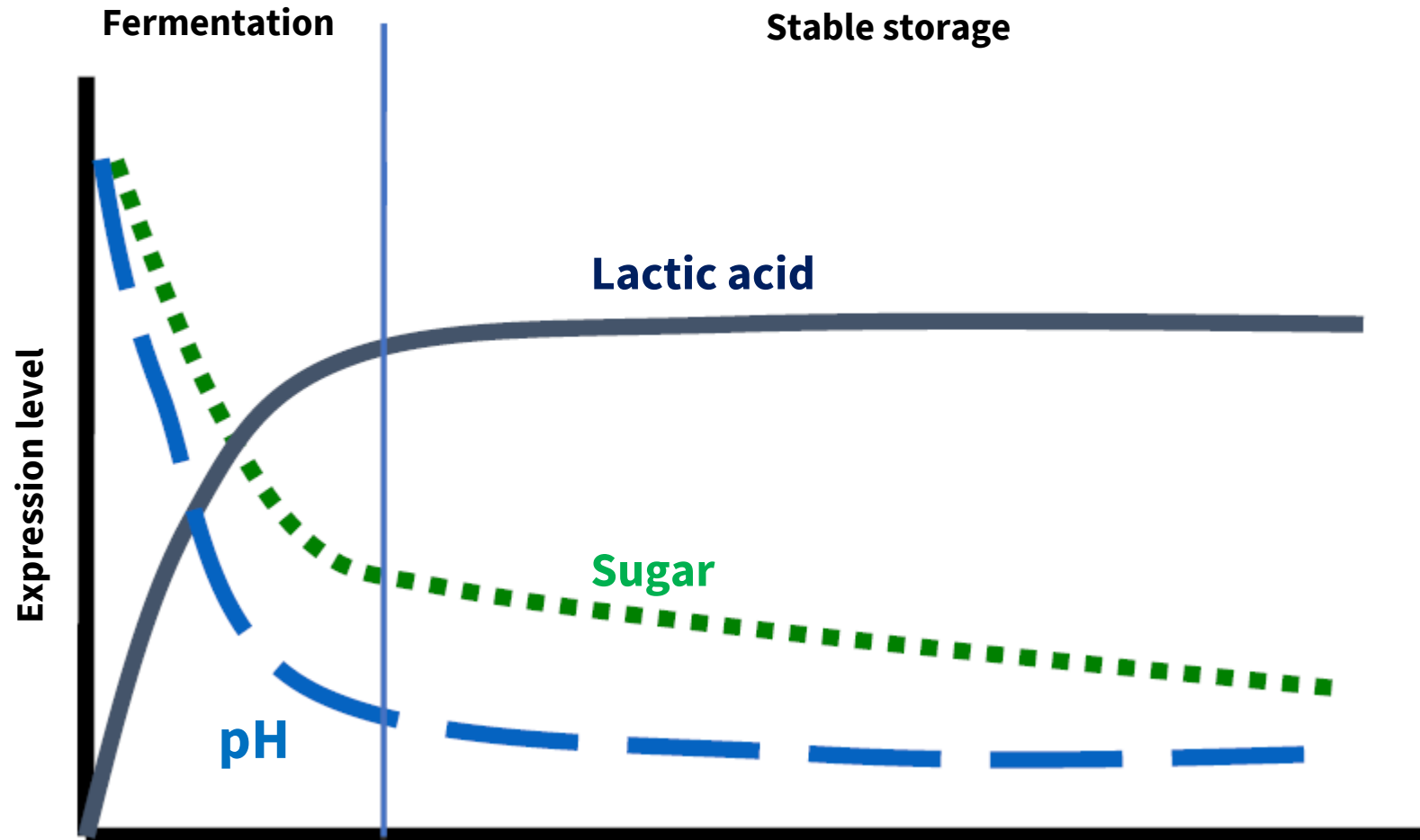
(Sano – Analysis results and Consulting 2021)



Photosynthetic drying:

- Increase digestible nutrients
- Max. time flexibility during ensiling (same day silage)
- Optimum conditions for lactic acid bacteria
- Turning two hours after cutting
- Respect 10cm stubble height

OPTIMAL YIELD PROTECTION



Good professional ensiling practice:

- Same day ensiling (use of photosynthetic drying effect)
- Chopping length adapted to drymatter content
- Use of silage additives / Lactic acid bacteria (Labacsil):

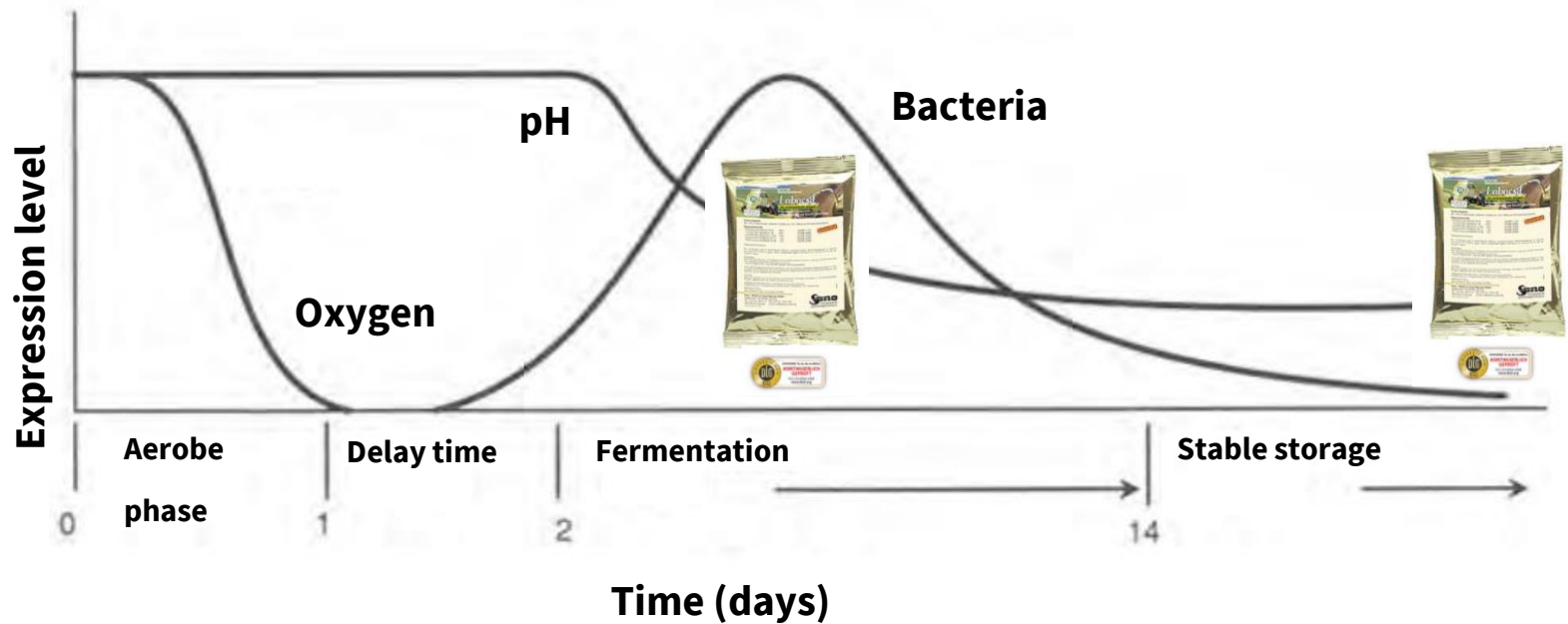
L. plantarum, *E. faecium*, *L. buchneri*, *P. pentosaceus*



(Überarbeitet nach Kung, 2010; Sano 2021)

OPTIMAL YIELD PROTECTION:

- Short delay time (ADIN, temperature, proteolysis; protein damage)
- Rapid pH reduction due to lactic acid producers (suppression of fermentation pests)

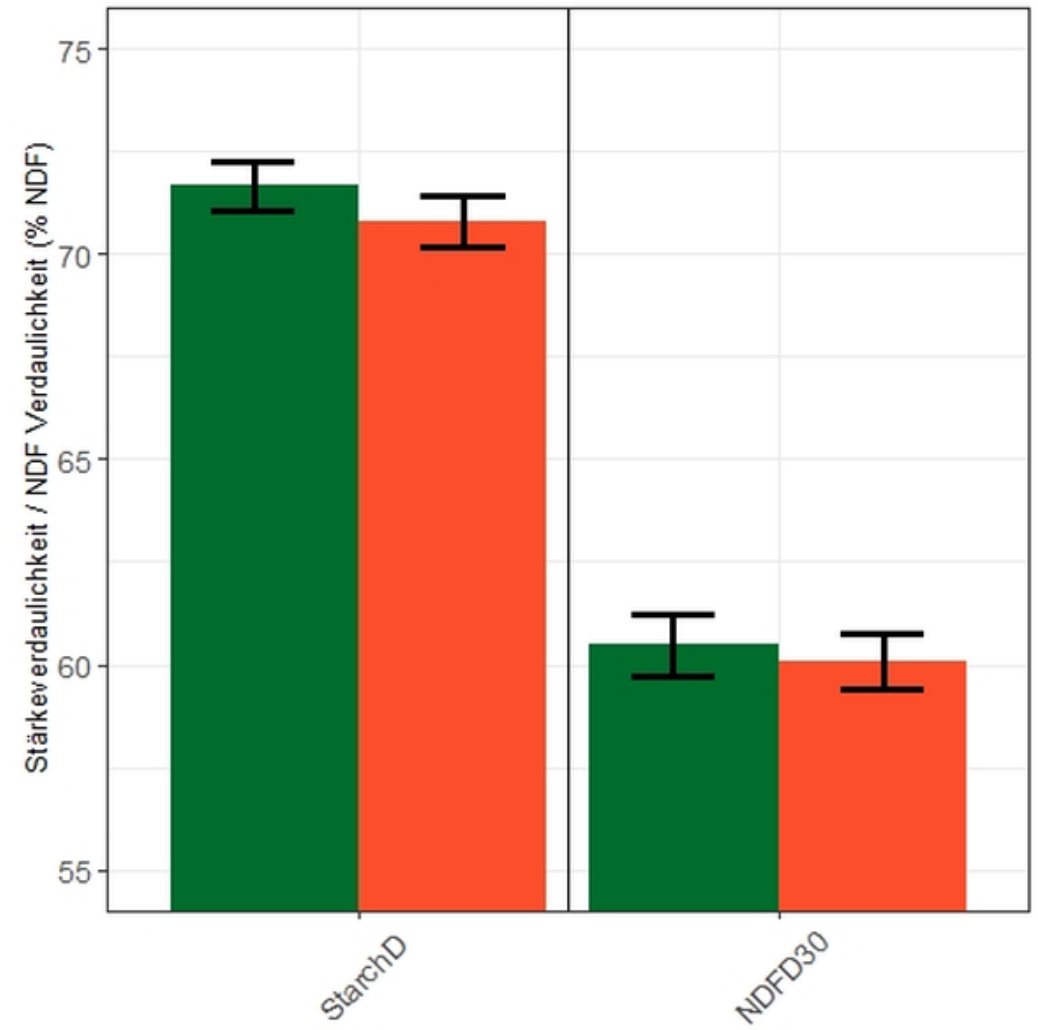
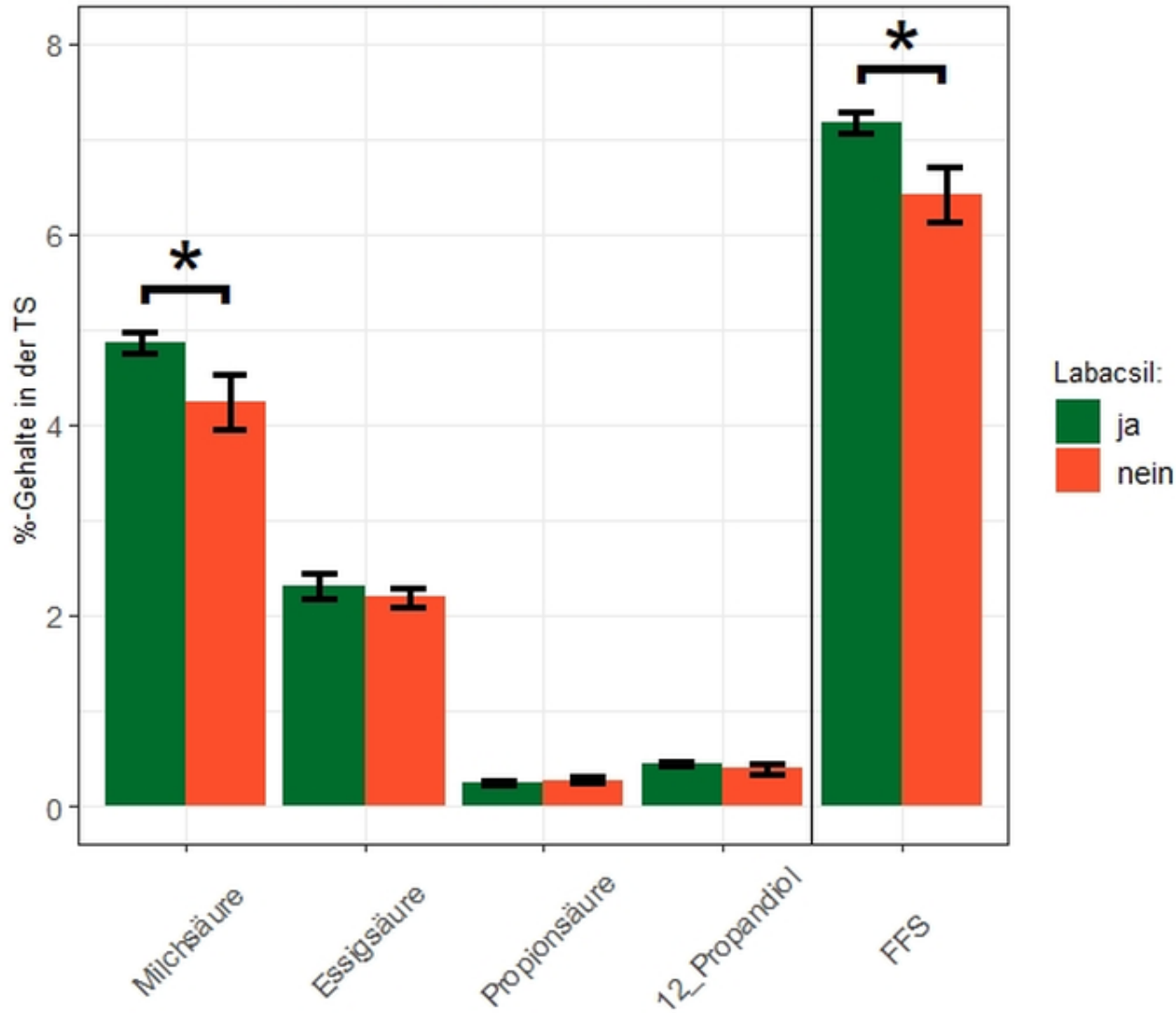


PROBINGINFORMATION		MINERALSTOFFE	
Labor ID: 31137 012	Vorder: 1.0	Relasche (KA %TS)	5.91
Eintragjahr: 2021	Serie:	Kalzium (Ca %TS)	0.26
Futtwert: MAISSILAGE	Schwellf:	Phosphor (P %TS)	0.29
Analyse: NIK		Magnesium (Mg %TS)	0.19
		Kalium (K %TS)	1.01
		Schwefel (S %TS)	0.14
		Natrium (Na %TS)	
		Chlor (Cl %TS)	
		Eisen (Fe ppm)	
		Mangan (Mn ppm)	
		Zink (Zn ppm)	
		Kupfer (Cu ppm)	
		Molibdin (Mo ppm)	
NIRS ANALYSE RESULTATE		QUALITÄTSPARAMETER	
Feuchfrucht:	79.8	pH	3.72
		flüchtige Fettsäuren FFS (%TS)	6.56
		Milchsäure (%TS)	6.41
		Milchsäure (% FFS)	98
		Disäure (%TS)	0.15
		Rutensäure (%TS)	
		1, 2 Propandiol (%TS)	0.27
QUALITÄTSPARAMETER		NIRS statistische Genauigkeit	
Vermischung	Gering bis Null		
NIRS statistische Genauigkeit	Gute Vorhersage		
		Verdauliche Masse, gemitt. (DM %TS)	66.6
		Netto Energie Laktation (NEL MJ/kg)	6.32
		Netto Energie Erhaltung (ME/kg)	6.77
		Netto Energie Zuwachs (ME/kg)	4.24
		ME (erhältl. DM)	10.52
		AS-Prozent, % des Gesamtproteins	61.9
		NDF Verdaulichkeitsrate (Kf, %N, Van Amburgh, Lager 2-6)	4.16
		NDF Verdaulichkeitsrate (Kf, %N, uNDF)	4.7
		Stärke Verdaulichkeitsrate (Kf, %N, Mertens)	18.2
		Relativer Futtwert (RFV)	
		Relative Futtwertqualität (RFQ)	
		Milch pro t (kg/t)	1275
		Verdauliche organische Masse Index (kg/t)	
		Nicht-Faser Kohlenhydrate (NFC %TS)	37.2
		Nicht-Struktur Kohlenhydrate - StZ, %TS	23.9
		Nicht-Struktur Kohlenhydrate - WIZ, %TS	29.2
		DCAD (mmol/100 g TS)	
		RFV - Index Faserfütterung	2.70
		Summativer Index % (Massenausgleich)	104.3
		Zusätzliche Proteininformation, Quelle und Dosis	

Cumberland Valley Analytical Services, Inc.
4999 Zane A. Miller Drive, Waynesboro, PA 17268
www.forageanalysis.com | info@forageanalysis.com | 717-265-1980 | 800-CVAS-4-LAB

(Sano – Analyseergebnisse und Consulting 2021)

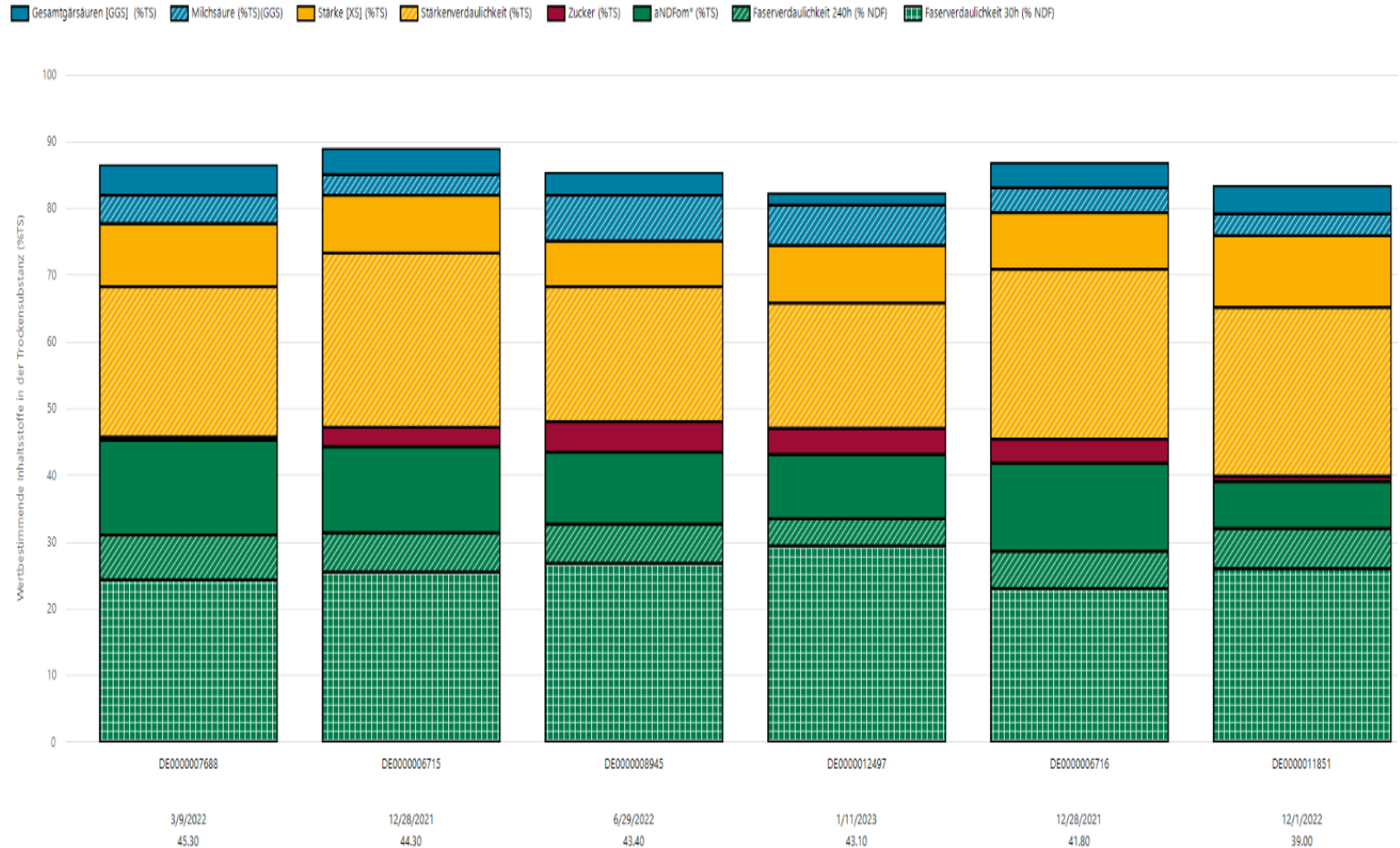
INOCULATION AND FERMENTATION SUCCESS



EUROSAN FEED-DATABASE:



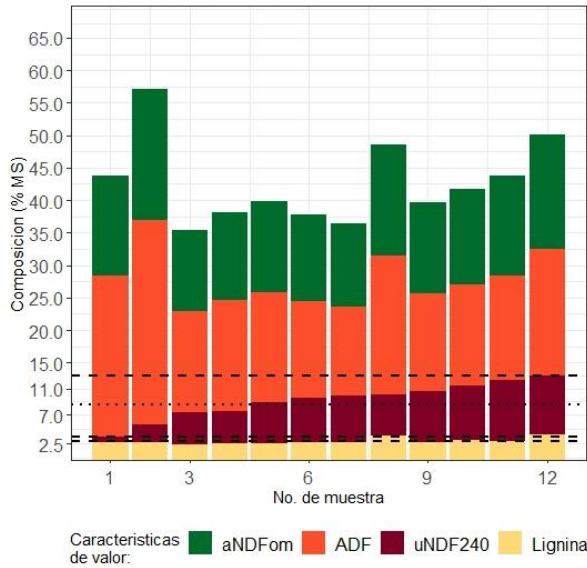
- Make your success plannable.
- Simple benchmarking with your smartphone.
- In-farm and looking beyond the horizon.
- Data-driven improvement of own silage management via beyond-year data and fermentation acid profile (Labacsil).



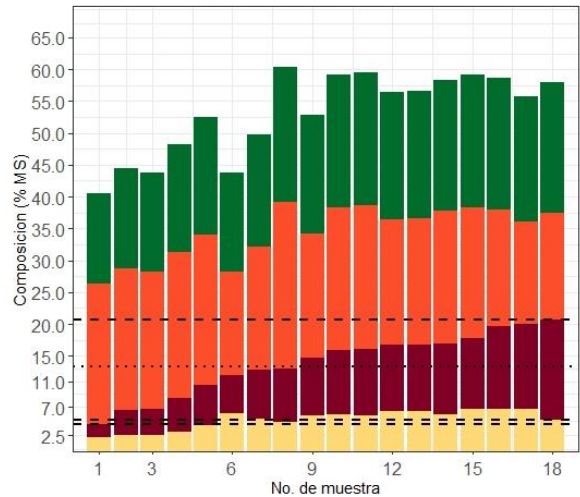
(Sano – EUROSAN Futterdatenbank 2023)

LOOKING BEYOND THE HORIZON

Sano CL: Silo de Maiz 2019



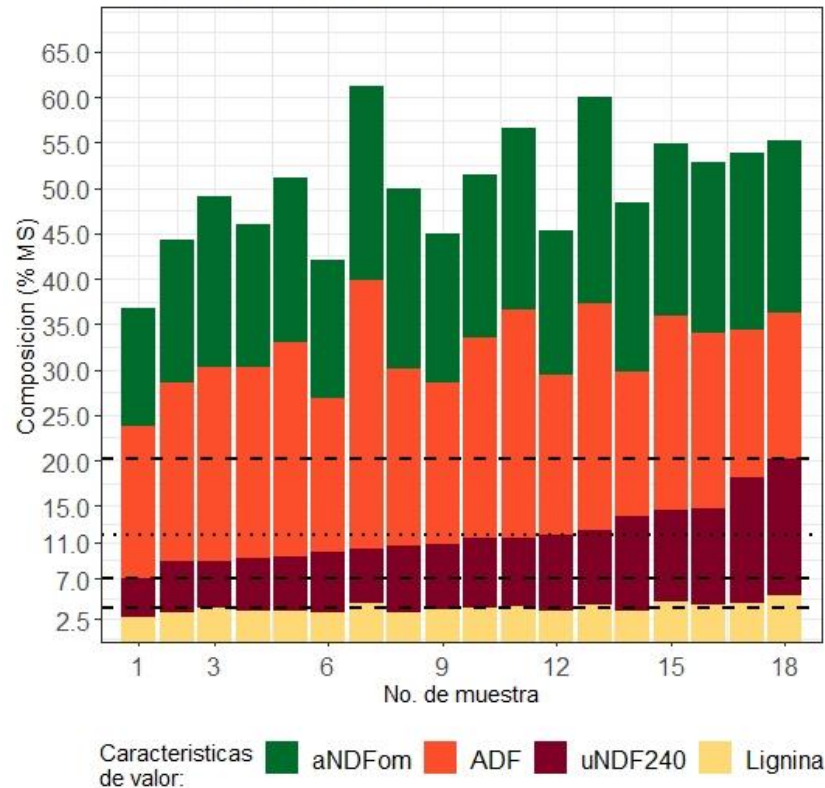
Sano CL: Silo de Pradera 2019



Caracteristicas de valor: aNDFom ADF uNDF240 Lignina

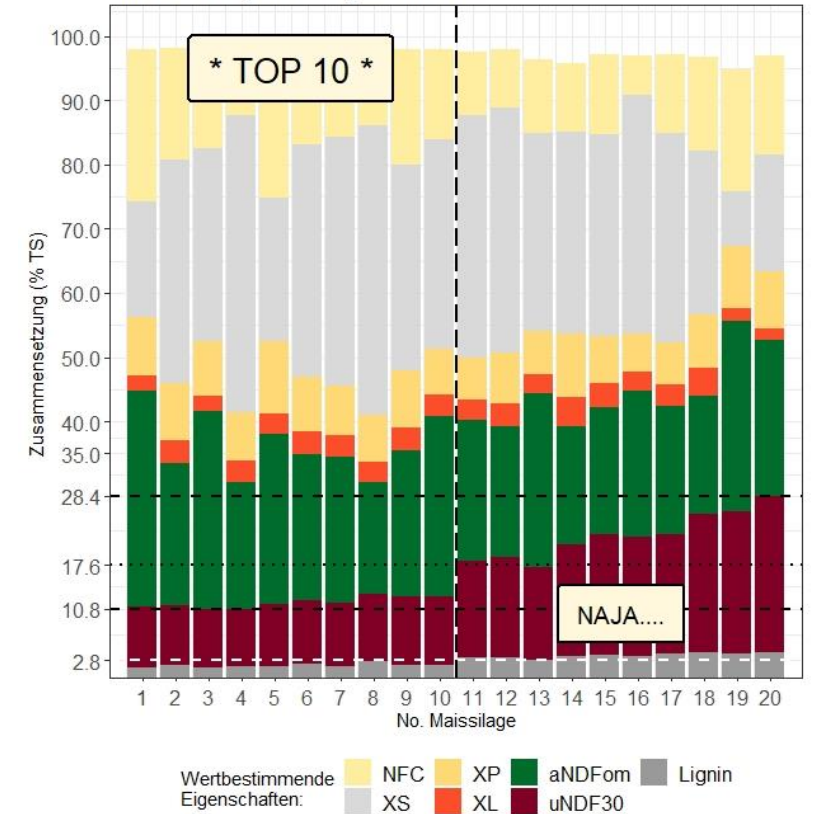
(Sano Chile 2020)

Sano MX: Silo de Maiz 2020



(Sano Mexico 2020)

Sano DE: Top-Maissilagen Ernte 2022



(Sano 2023)

KNOWING THE RESULT

- 1) **Improving silage qualities** is rewarded with **higher animal performance** and **higher farm income**
- 2) **Look/Check for the uNDF!!**
- 3) **Photosynthetic drying** and the combination of efficient lactic acid bacteria (**Labacsil**) **increase** and **ensure ensiling success**
- 4) **Sanolab silage analyses** and EUROSAN forage database (CNCPS analytics and benchmarking) **facilitate farm-specific decision making**



<https://sano24.de/nir-amino>





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SmartDairyNutrition



<https://sano24.de/>

DANKE!

Gefällt mir •  162.419

Sano – CNCPS - Team



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All
Digestible ?

