



How to optimize feed efficiency by automatic data exchange

SESSION 05

PLF Technology development and data accessibility

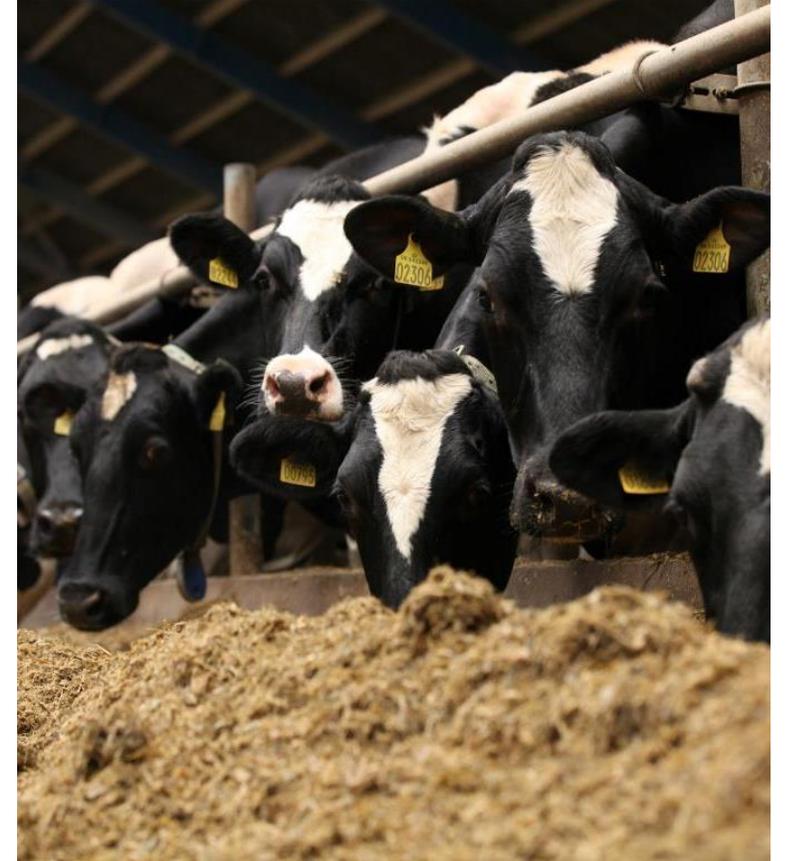
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SEGES Innovation

May 25, 2023

Agenda

How to optimize feed efficiency by automatic data exchange

- Why optimize
- Challenges
- How to optimize
- What is the outcome for the farmer



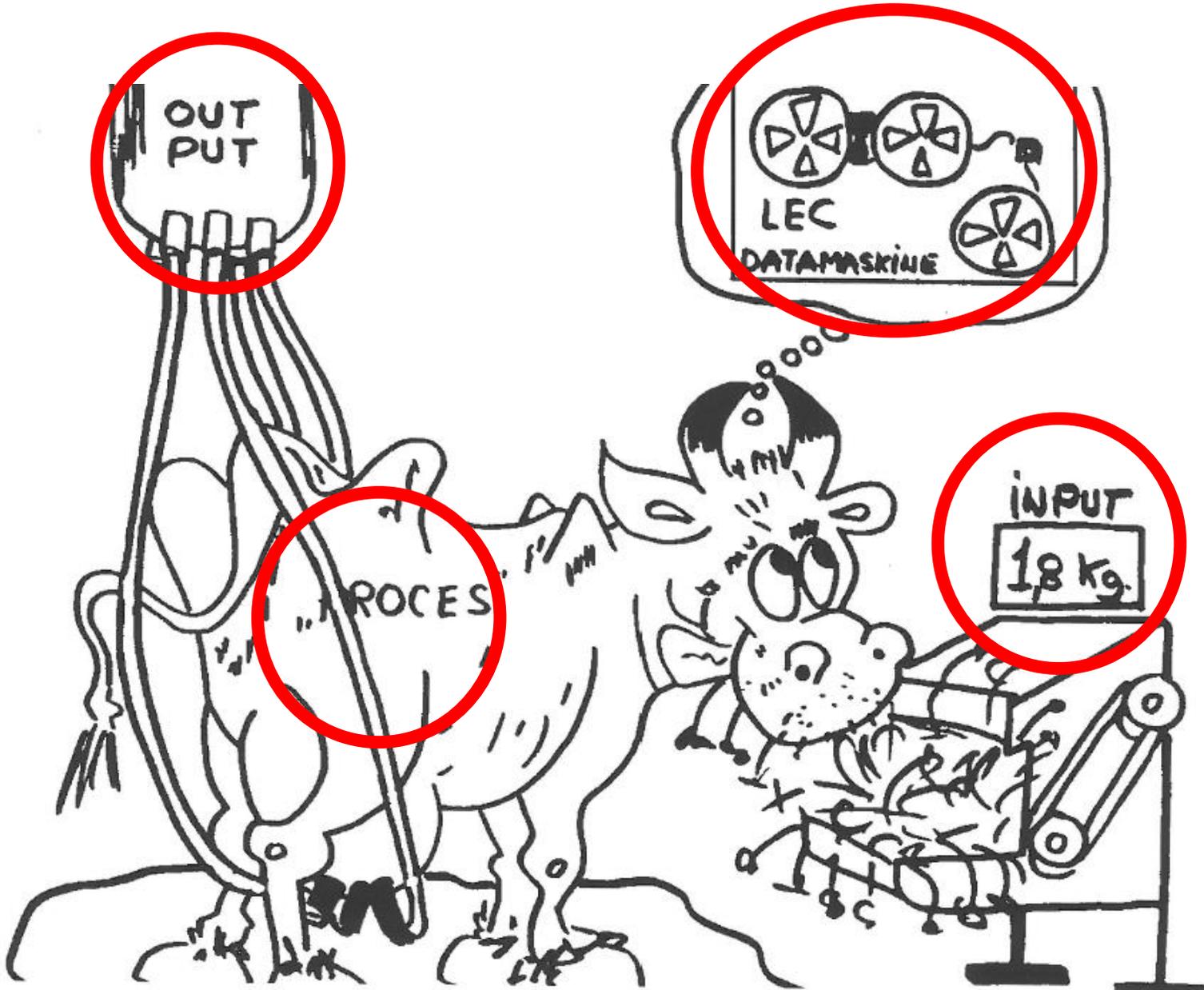
SEGES Software

- **Management system for**
 - **2500 farms, mainly dairy**
 - **200 advisors**
 - **200 veterinarians**
- **Central cattle database including the mandatory movement data to ministry**
- **Exchange of cattle related data with stakeholders across the dairy business**

And they are all asking for automated data and value of data

SEGES Innovation is working on that through innovation projects and usage of newest technology

It is all about input and output – also optimizing the feeding

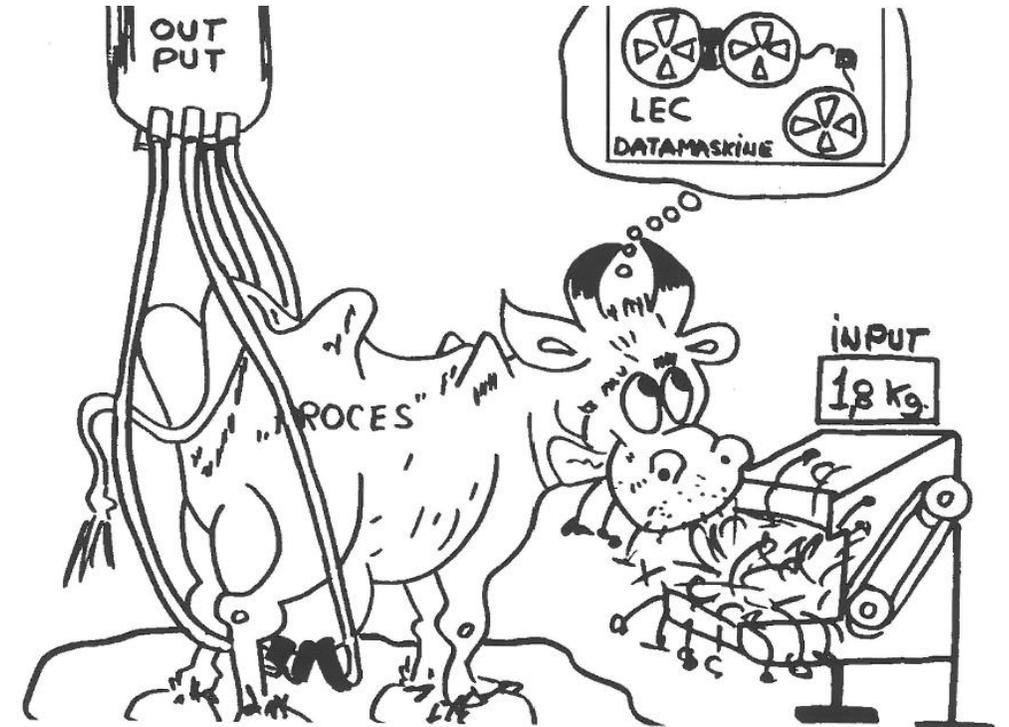


- Optimize feed efficiency for the feed economy
- Reduce nitrogen and later also phosphor to the environment
- All for the benefit of the farmer economy and the health of the cow
- Later reduce methane emission

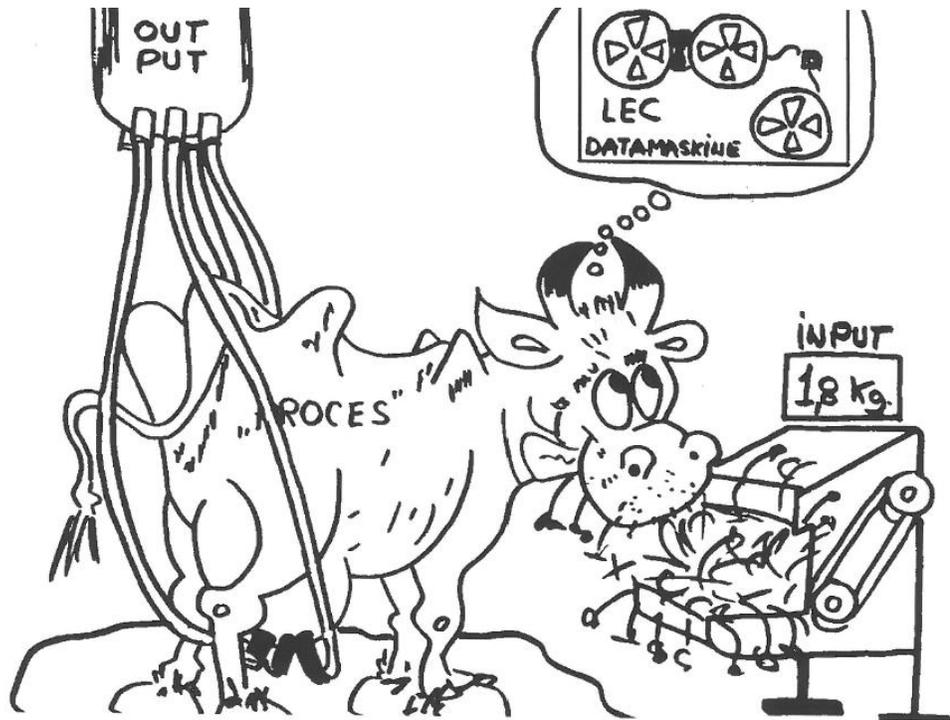
It is all about input and output – requirement from the society



- Governmental regulations
- Documentation
 - Reduction requirement



So why don't we just do it?



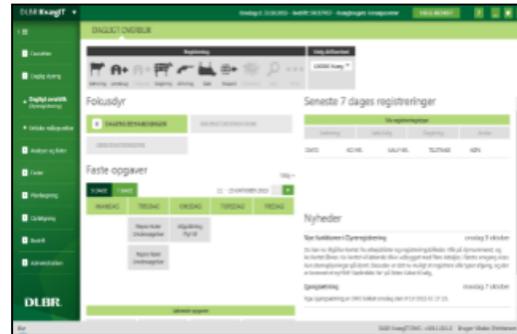
- Data needs to be gathered in one place and put in the “Data machine” to get a daily surveillance of the production
- Data from the input side; feeding data requires a lot of manual work
- Data from the output side; milking equipment and dairies needs to be automated

External data

E.g.

- Viking
- NAV
- RYK
- **Dairies**
- Slaughterhouses
- **Eurofins | Steins**
- Veterinary practitioners
- Ear tag manufacturers
- **Processing equipment**
- milk, feed, activity, weights, etc.

SEGES LIVESTOCK DIGITAL / DMS



DMS



EasyCow



WebDyr
Webdyr Plus



Claw registration

SINGLE SIGN-ON

WEB SERVICE LAYER

NorFor

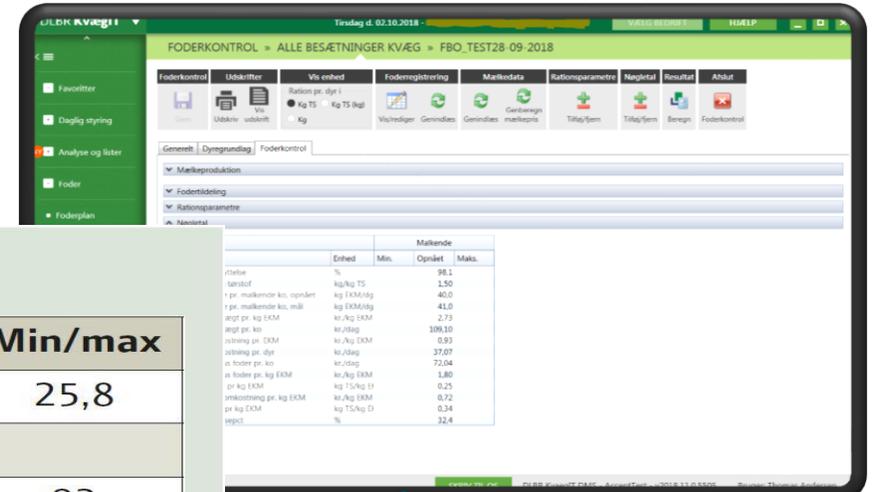
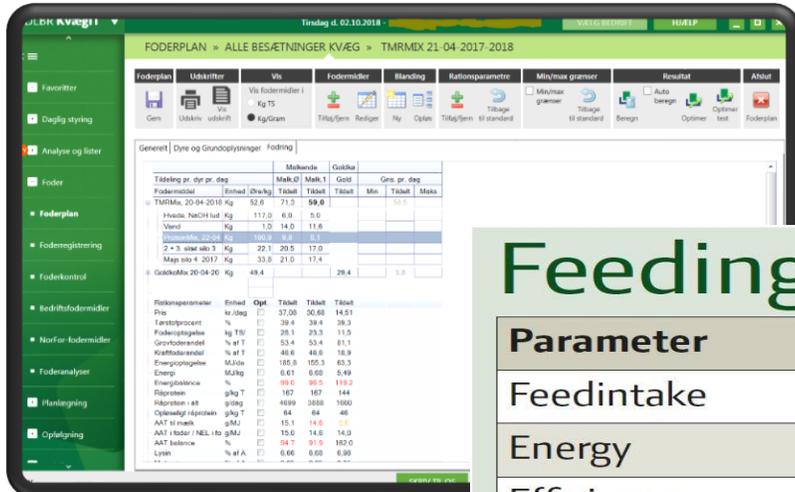
Data
warehouse

Central Cattle
Database

GLR/CHR
Owned by Danish
Veterinary and
Food
Administration

SEGES
INNOVATION

Automatic transfer of feed data



Feeding

Parameter	Unit	Achieved	Min/max
Feedintake	kg TS/day	26,6	25,8
Energy	MJ/kg TS	6,58	
Efficiency	%	92,1	93
Milk ÷ feed	DKR	1,25	1,20
CO ² Equivalent	Kg/day	14	



Daily feed evaluation

Daily data from

- Feeding equipment
- Dairy
- Cattle database

Feed evaluation from NorFor

Daily data processing From DWH

Rationsparametre

Rationsparametre	Enhed	Malkende		
		Min.	Tildelt	Maks.
Foderoptagelse	kg TS/dag		24,9	
Kraftfoder	kg TS/dag		9,8	
Energiopptagelse		165	165	
Energi	g TS		6,64	
Energibalance	%	100,0	100,4	101,0
Råprotein	g/kg TS		162	170
AAT til mælk	g/MJ	15,00	14,15	16,00
Fedtsyrer	g/kg TS	20	26	45
NDF	g/kg TS		326	
PBV	g/kg TS	10	25	20
Vombelastning	Ingen enhe		0,52	0,60
Stivelse	g/kg TS	0	224	
Grovfoderandel	% af TS		60,5	
Tørstofprocent	%		37,2	
Råprotein i alt	g/dag		4.020	
Lysin	% af AAT	6,40	6,90	

Mælkeproduktion

Parameter	Enhed	Malkende
Mælk mejeri	Liter/dag	8.964
Mælk hjemmeforbrug	Liter/dag	240
Fedtpct.	Pct	4,17
Proteinpct.		3,68
Mælkepris	kr/kg	3,59

Fodertildeling

			Malkende	
Antal dyr			278	
Fodermiddel	Øre/kg	Enhed	Tildelt dyr/dag	Tildelt i alt kg

Nøgletal

Nøgletal	Enhed	Malkende		
		Min.	Opnået	Maks.
Energiudnyttelse	%		99,6	
Dagsydelse pr. malkende ko	kg EKM/dg		35,5	
Dagsydelse pr. malkende he	kg EKM/dg		34,7	
EKM pr. kg tørstof	kg/kg TS		1,43	
Mælkeindtægt pr. EKM	kr./kg EKM		3,44	
Foderomkostning pr. EKM	kr./kg EKM		1,08	
Mælk pr. foder pr. kg EKM	kr./kg EKM		2,36	
Kraftfoderomkostning pr. kg EKM	kr./kg EKM		0,66	
Foderomkostning pr. dyr	kr./dag		38,34	
Mælk minus foder pr. ko	kr./dag		83,75	
Foderomkost., EKM, std. grovfoderpris	kr./kg EKM		1,08	

From raw data to advanced decision tools (Big Data)

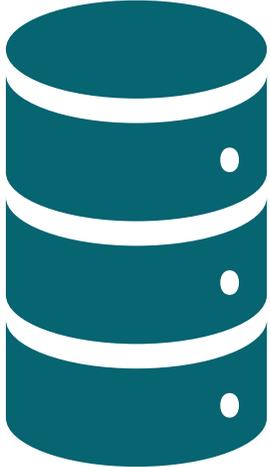
Kildesystemer



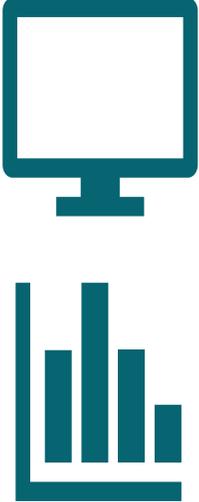
ETL proces



Datawarehouse

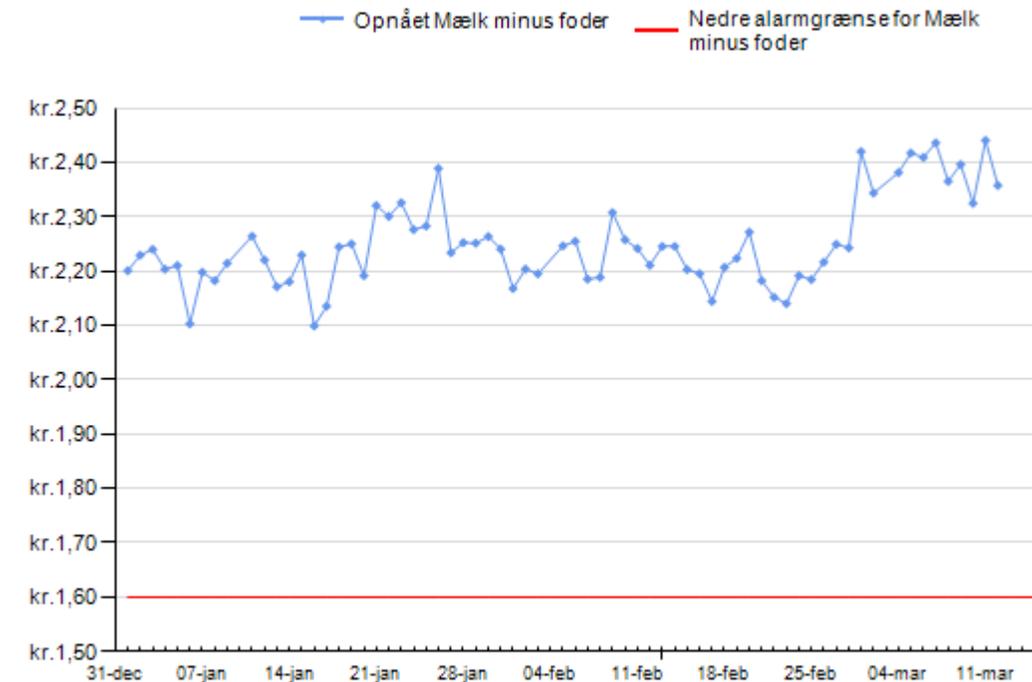
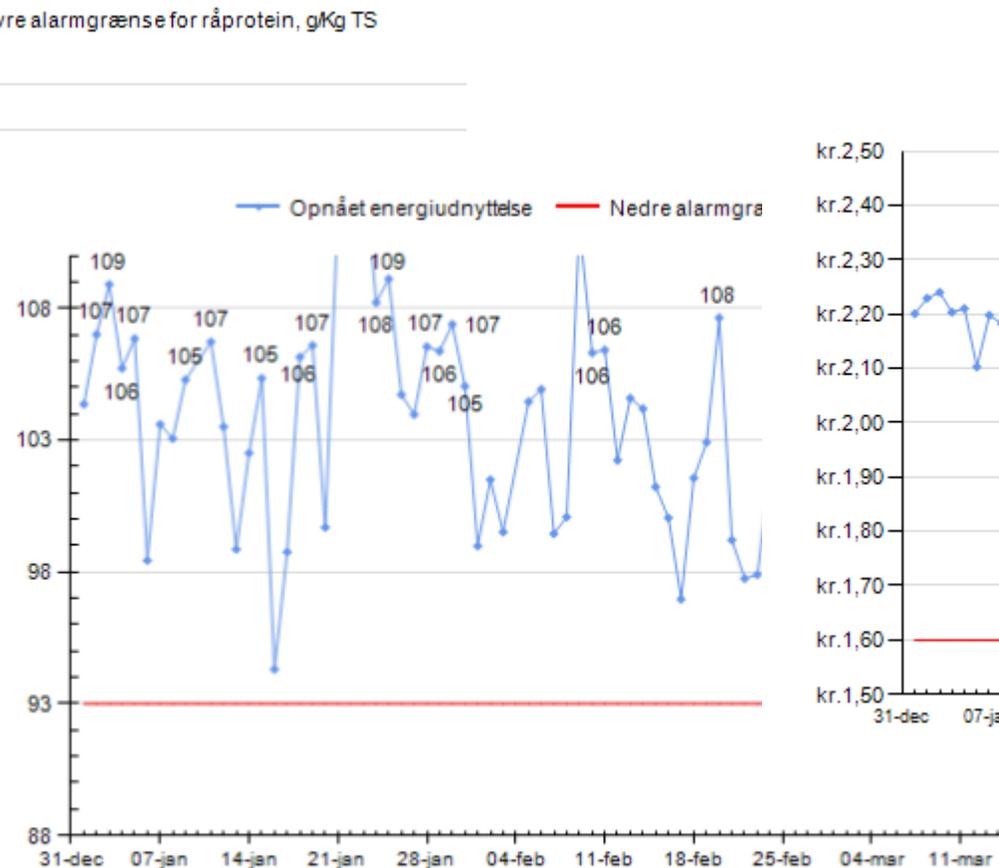
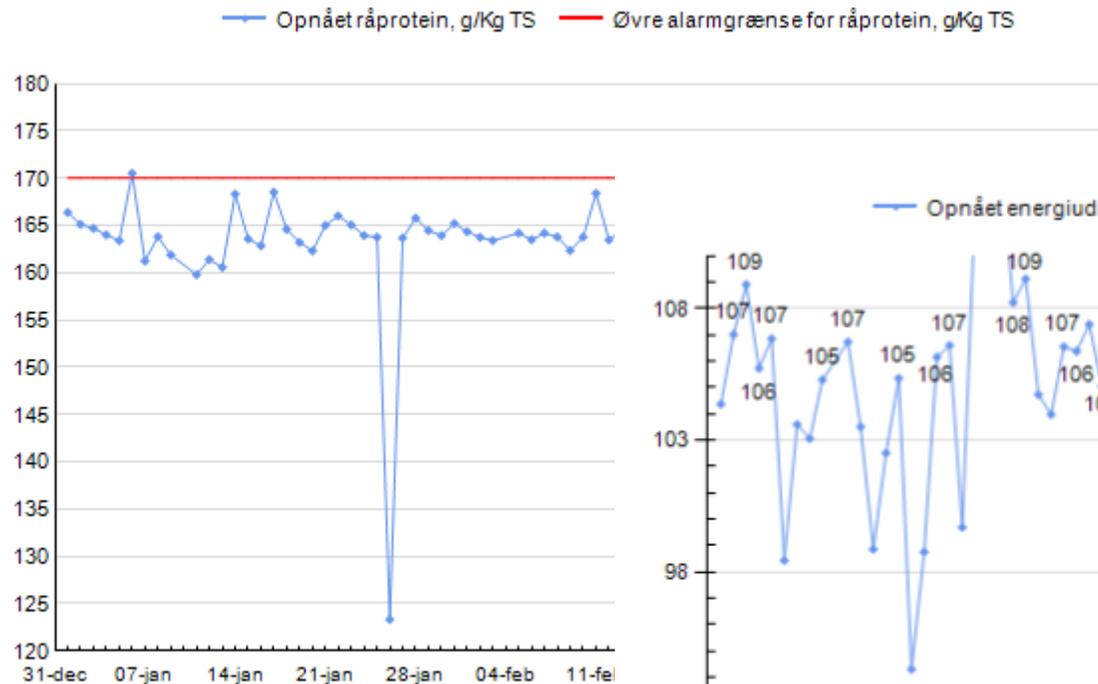


Analyse og rapportering



From daily feed evaluation to KPI Dashboard

Fodring		
✓	Råprotein i foder, malkende (Gram/kg TS)	162 Maks 170
✓	Energiudnyttelse, malkende (%)	100 Min 93
✓	Mælk minus foder, malkende (Kr/kg EKM)	2,36 Min 1,60



Reports on timeseries of data

Foderkontroller i perioden:

01-05-2021 07-05-2023

Visning på graf:

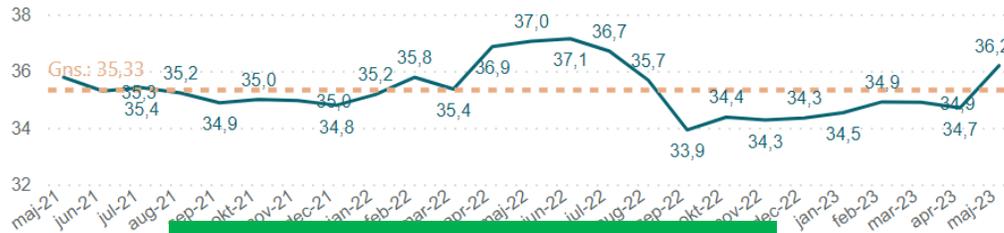
Måned

Uge

Dag

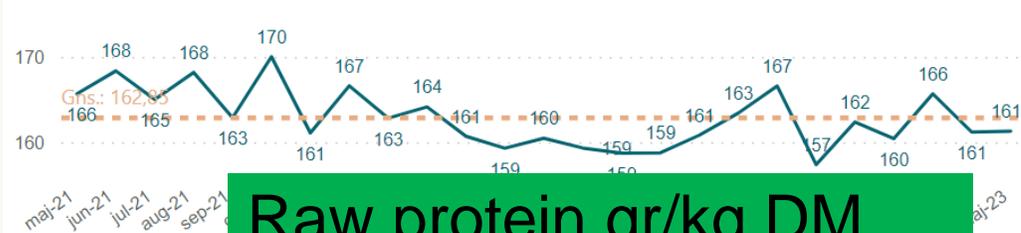
For hver graf kan du i listen vælge det nøgletal du vil følge udviklingen for.

EKM produceret pr. ko (Kg EKM/dag)



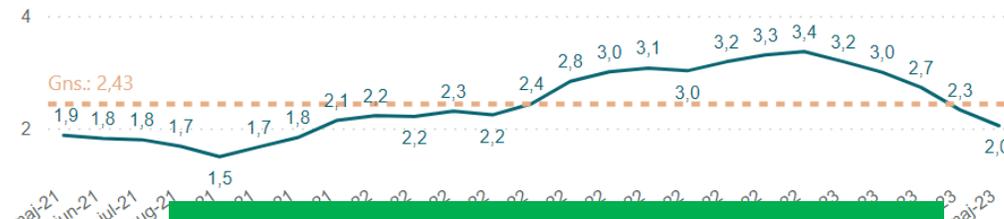
Milk (ECM) per cow

Råprotein i foder, malkende (Gram/kg TS)



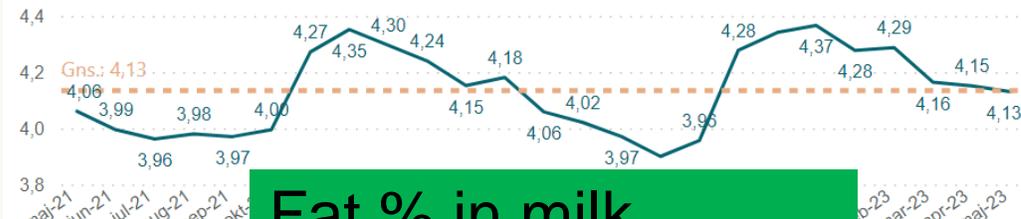
Raw protein gr/kg DM

Mælk minus foder, malkende (Kg/kg EKM)



Income; Milk minus Feed

Fedtpct. (%)



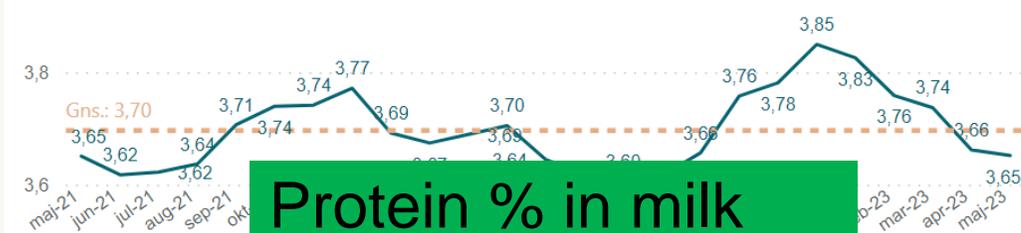
Fat % in milk

Energiudnyttelse, malkende (%)



Energy efficiency

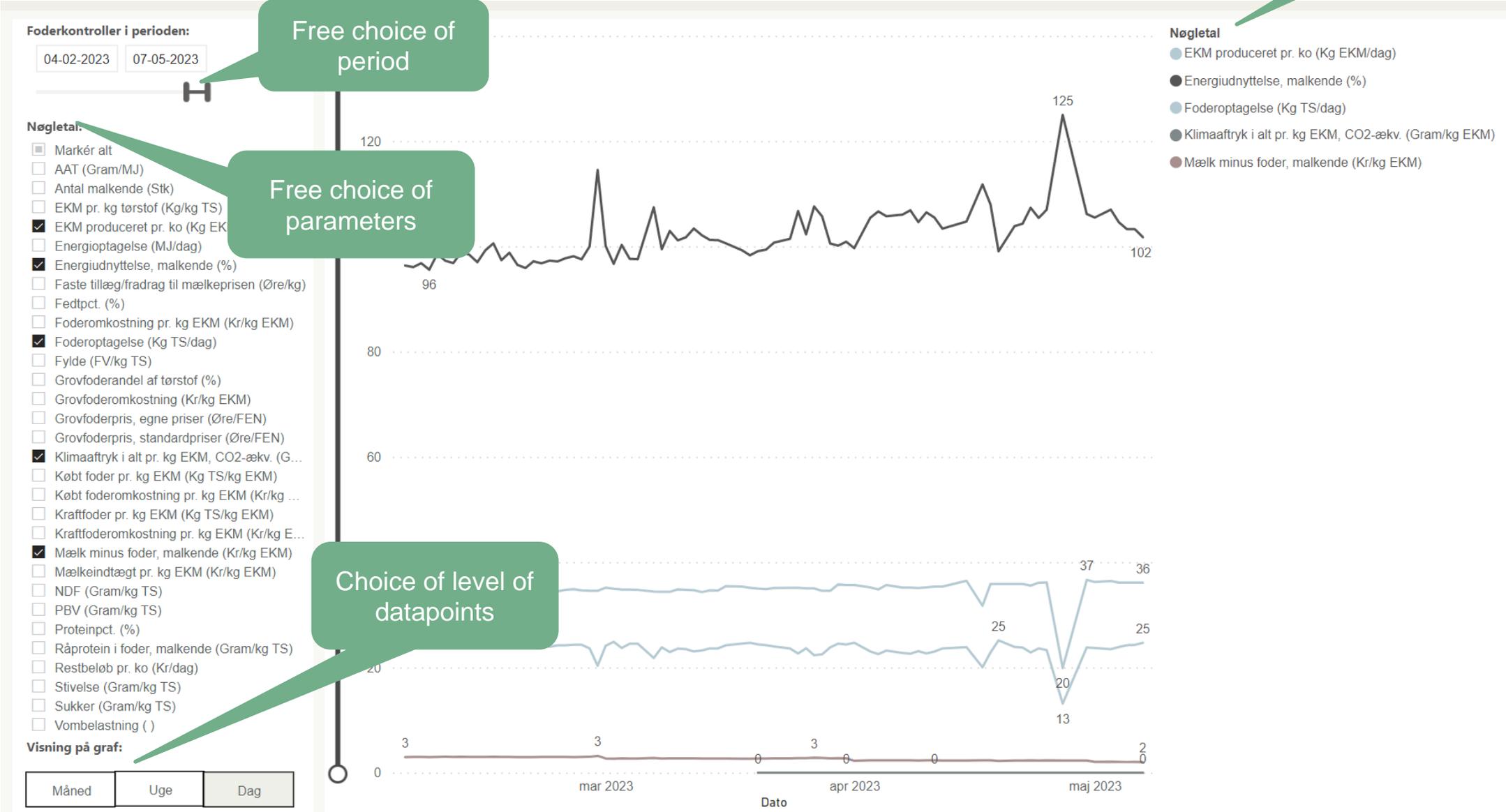
Proteinpct. (%)



Protein % in milk

Dynamic (Power BI) report on all parameters

The chosen parameters



Free choice of period

Free choice of parameters

Choice of level of datapoints

Benchmarking Milk minus Feed

Nøgletal fra Foderkontrol

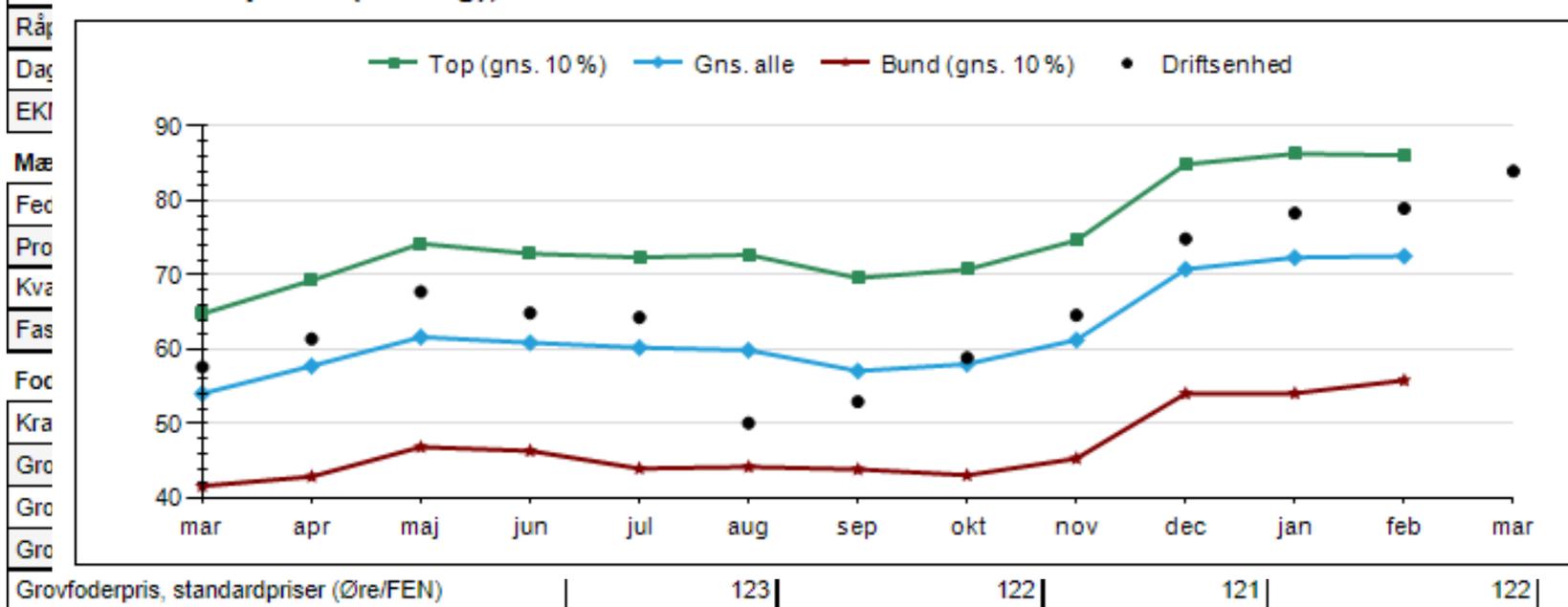
Nøgletal	Driftsenhed	Sammenligningsgruppe, 01.02.2023 - 30.04.2023 Antal driftsenheder = 448 Race = Tung, Malkesystem = Konv., Økologi = Nej, Mejeri = Arla		
	Foderkontrol (09.05.2023)	Top, gns. 10 % (højeste restbeløb)	Gns. alle	Bund, gns. 10 % (laveste restbeløb)

Restbeløb (Mælk minus foder) *

Restbeløb pr. ko (Kr/dag)	73,93	83,19	68,12	49,18
Mælkeindtægt (Kr/kg EKM)	3,24	3,24	3,22	3,14
Foderomkostning (Kr/kg EKM)	1,21	1,16	1,33	1,56
Restbeløb (Kr/kg EKM)	2,03	2,08	1,89	1,58

Effektivitet

Restbeløb pr. ko (kr./dag), seneste 12 mdr.

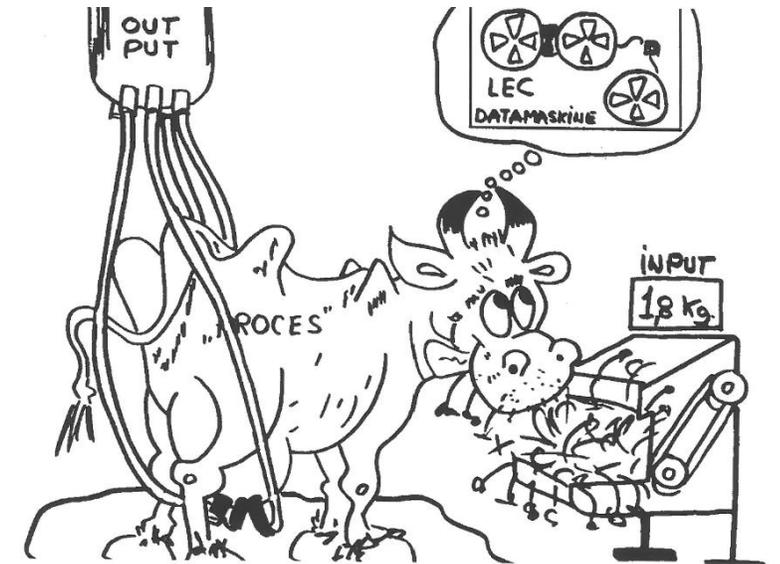


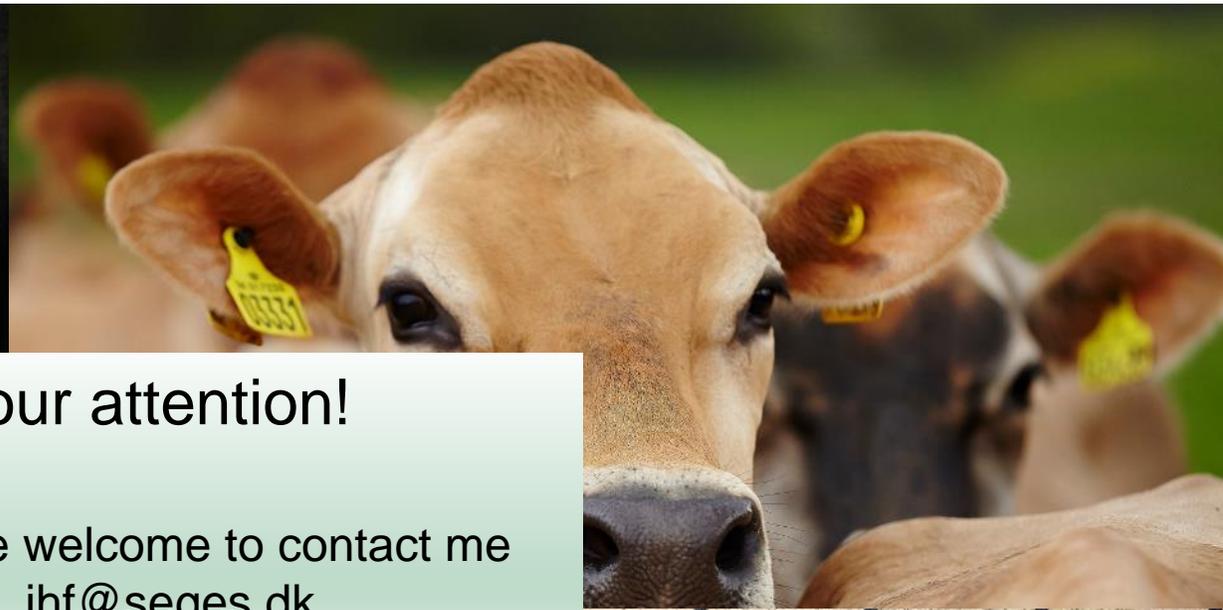
The digital feedstuff chain - Status



Summery

- Data connections have been automated
- Newest knowledge within nutrition have been implemented in the "Data machine"
- Newest technology to present status, benchmark and development in production
- Automated data
- Provides the tools for
 - Optimizing the nutrition
 - Optimizing the economy
 - Minimizing the waste of nutrients to the environment
 - Documentation and optimization for Carbon Footprint
- Used by 25% of the herds / 40% of the cows in full scale
- Still a lot of improvement potential
 - More users
 - More details on group/animal level
 - Calibration of equipment
 - Use to days output for regulations in tomorrow's input
 - Improve data collection and atomization in the whole chain





Thank you for your attention!

For more information, you are welcome to contact me
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