DENMARK – DHI TECHNICAL UPDATE

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San Diego
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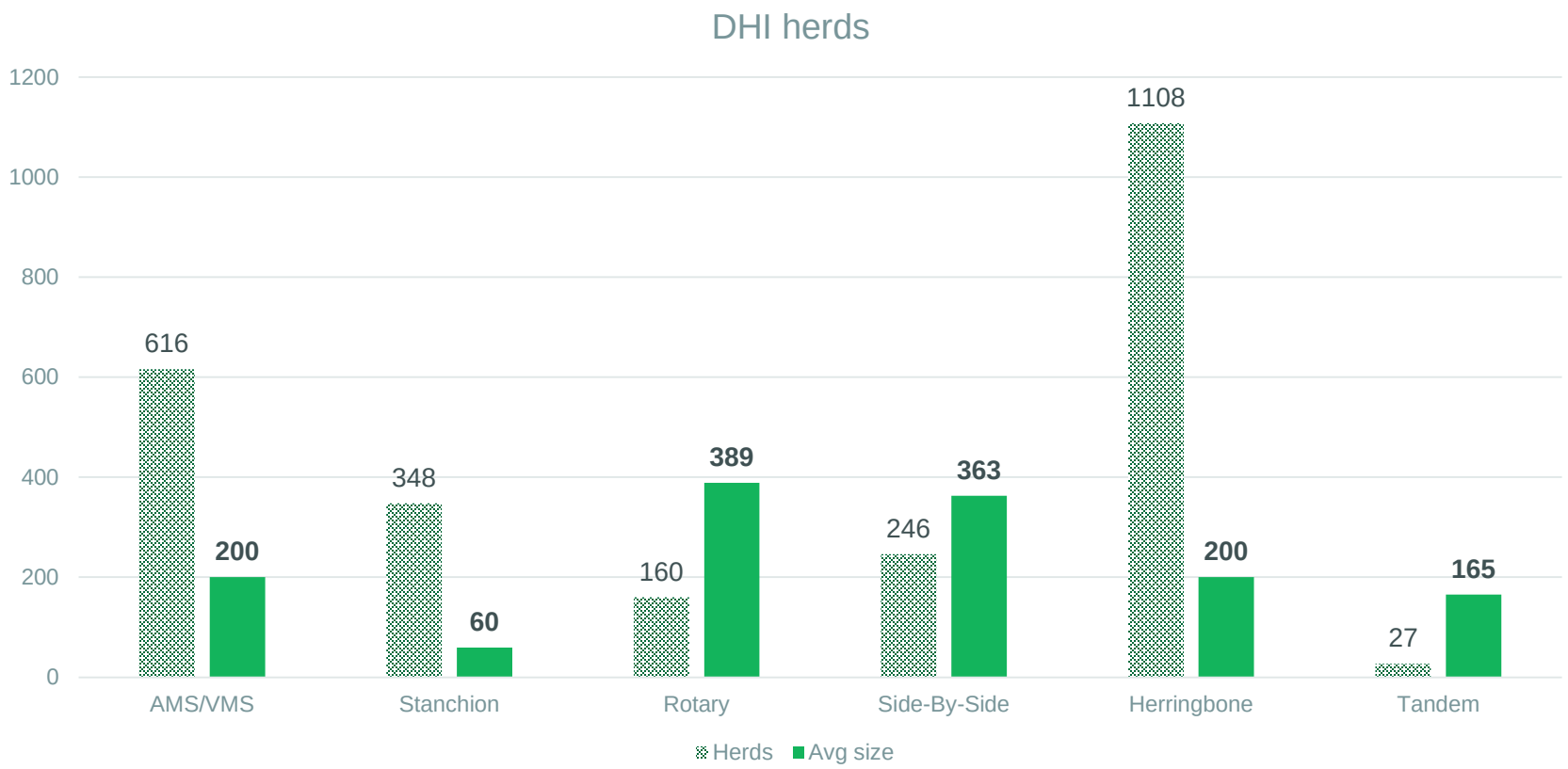
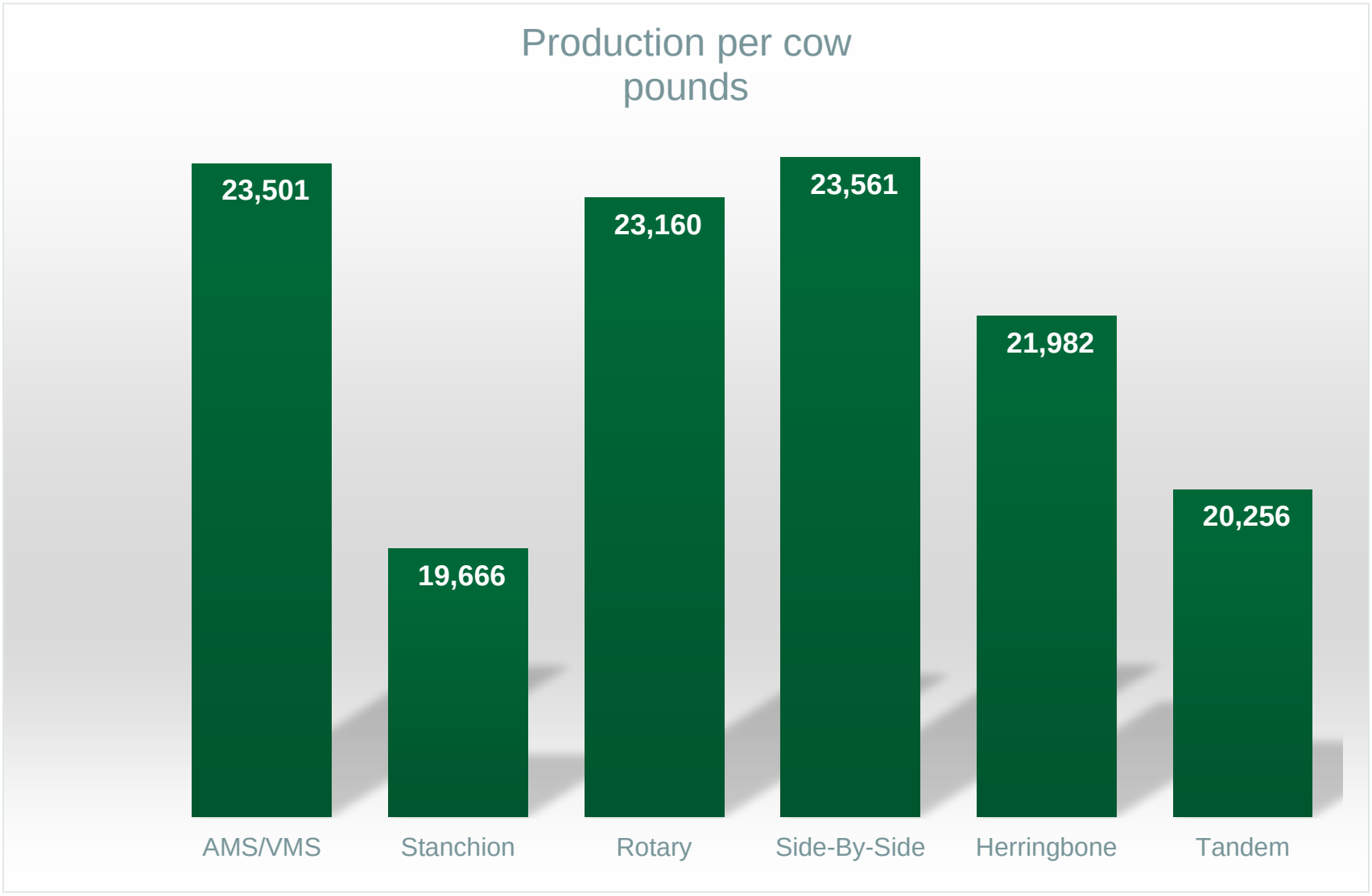
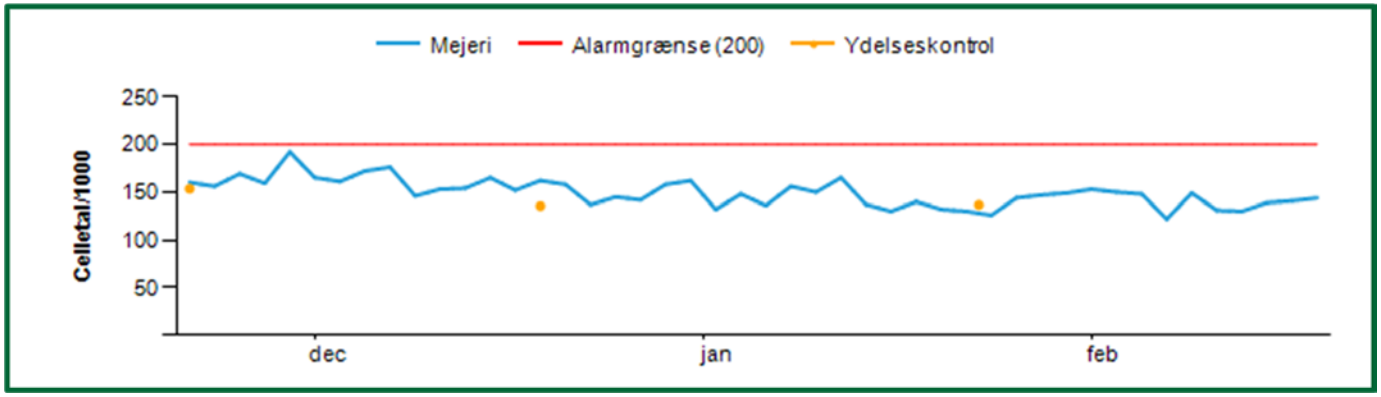
RYK provides milk recording for dairy cows. RYK are collecting annually about 5.5 million milk samples, serves 2,600 dairy farmers, and have a turnover of 15 million euro. We have 65 employees, and offices in Aarhus, Sorø, Holstebro, and Vojens.

OUR FARMERS AND THEIR HERDS

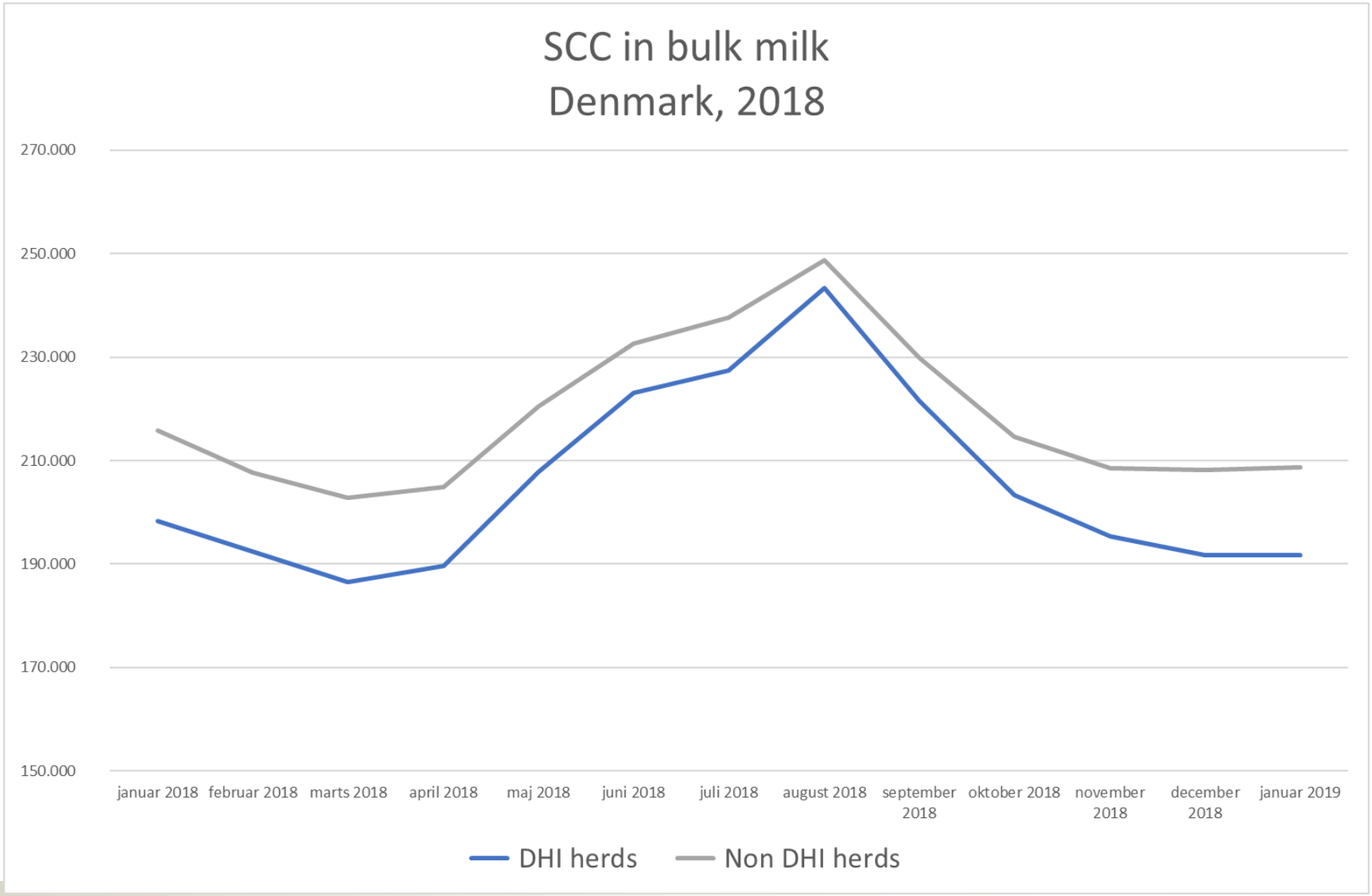



Production per cow
pounds
23,501
19,666
23,160
23,561
21,982
20,256
AMS/VMS
Stanchion
Rotary
Side-By-Side
Herringbone
Tandem

CELL COUNTS



Testday	11/20	12/18	1/22
All cows	153	136	137
-1st lactation	105	55	81
-2nd lactation	110	126	168
Later lactations	237	205	149
Dairy (testday or +/-1)	160	162	130


SCC in bulk milk
Denmark, 2018
270.000
250.000
230.000
210.000
190.000
170.000
150.000
januar 2018
februar 2018
marts 2018
april 2018
maj 2018
juni 2018
juli 2018
august 2018
september 2018
oktober 2018
november 2018
december 2018
januar 2019
DHI herds
Non DHI herds

FOCUS AREAS – THE DAIRY FARM

- Documentation, documentation, documentation
- Increasing number of cows per time unit
- Increasing amount of data
- Larger distance between cows and crucial decissions
- Welldefined responsibilities
- Better precision in data catch

FOCUS AREAS TO FOLLOW - DHI

- Catch a reprensentative milk sample
- Milkweights
- Data quality
- Cow ID
- Speed
- Data transfer
- Equipment for milk weigths and sampling
- Maintenance and cleaning
- Staff, recruitment and education

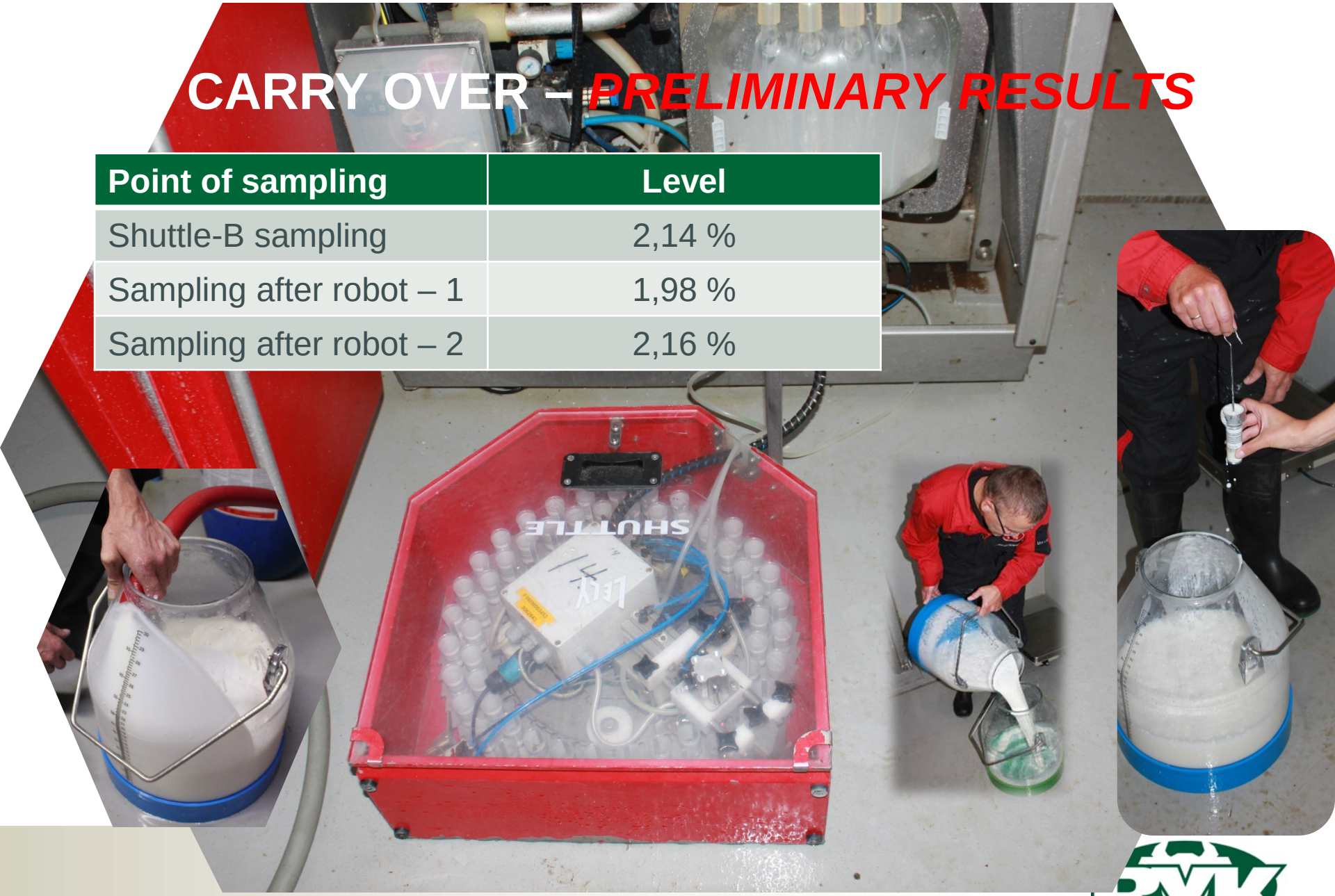
CARRY OVER FIXED METERS – *PRELIMINARY RESULTS*

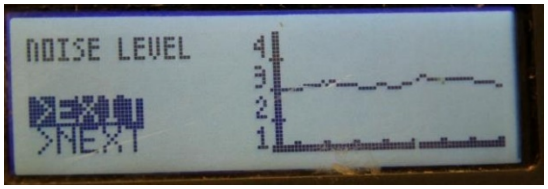
- Double 8 parlor
- DeLaval MM25 meters
- Tracked per milking point
- 2 sets of samples
- Sampled by 2 technicians, one per set of samples

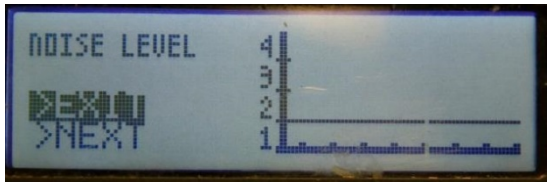
Carry over is calculated to 2,5 %

CARRY OVER – *PRELIMINARY RESULTS*

Point of sampling	Level
Shuttle-B sampling	2,14 %
Sampling after robot – 1	1,98 %
Sampling after robot – 2	2,16 %







ELECTRONIC NOISE

PROCESS FOR MILK RECORDING– RYK

Monday	Tuesday	Wednesday	Thursday
Delivery of equipment (Supervised or DIY test)	Pick up equipment and samples Validate data Correct data Prepare samples for shipment Push data	Samples arrive at lab Analyze Receive results	Receive results Check results Reports to farm

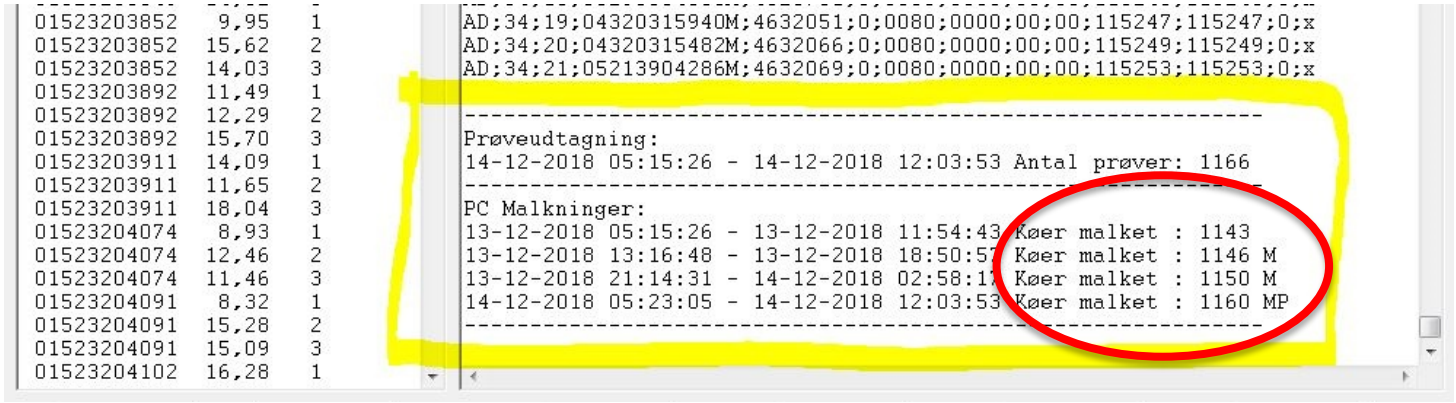
DATA CAPTURE SOFTWARE

Many versions of Herd Management systems

IDENTIFICATION

- Correct ID is key to valuable data

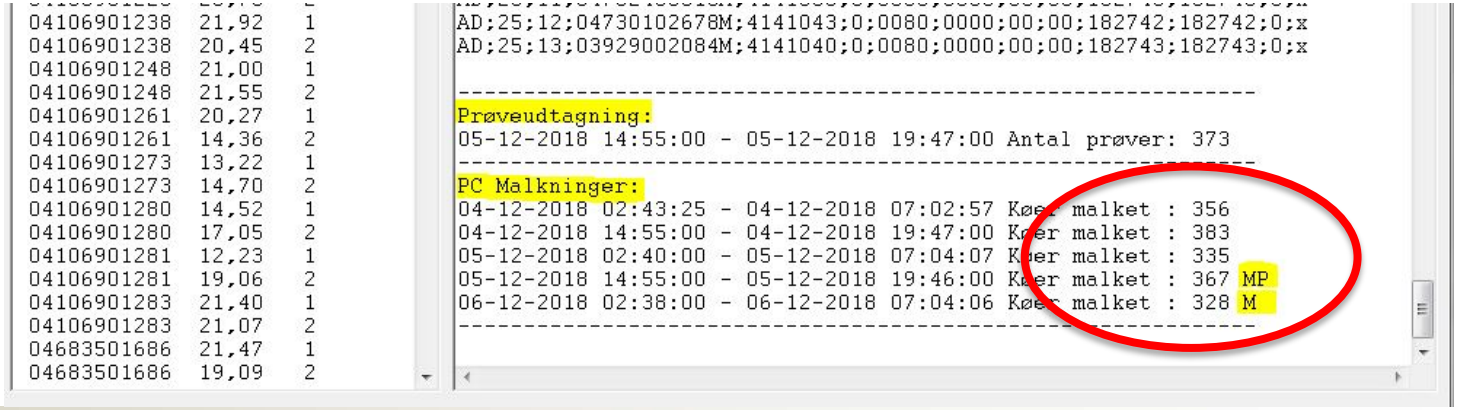
TESTDAY – CHALLENGES ON COW ID



01523203852	9,95	1
01523203852	15,62	2
01523203852	14,03	3
01523203892	11,49	1
01523203892	12,29	2
01523203892	15,70	3
01523203911	14,09	1
01523203911	11,65	2
01523203911	18,04	3
01523204074	8,93	1
01523204074	12,46	2
01523204074	11,46	3
01523204091	8,32	1
01523204091	15,28	2
01523204091	15,09	3
01523204102	16,28	1

```
AD;34;19;04320315940M;4632051;0;0080;0000;00;00;115247;115247;0;x
AD;34;20;04320315482M;4632066;0;0080;0000;00;00;115249;115249;0;x
AD;34;21;05213904286M;4632069;0;0080;0000;00;00;115253;115253;0;x

------------------------------------------------------------
Prøveudtagning:
14-12-2018 05:15:26 - 14-12-2018 12:03:53 Antal prøver: 1166
------------------------------------------------------------
PC Malkninger:
13-12-2018 05:15:26 - 13-12-2018 11:54:43 Køer malket : 1143
13-12-2018 13:16:48 - 13-12-2018 18:50:57 Køer malket : 1146 M
13-12-2018 21:14:31 - 14-12-2018 02:58:17 Køer malket : 1150 M
14-12-2018 05:23:05 - 14-12-2018 12:03:53 Køer malket : 1160 MP
------------------------------------------------------------
```



04106901238	21,92	1
04106901238	20,45	2
04106901248	21,00	1
04106901248	21,55	2
04106901261	20,27	1
04106901261	14,36	2
04106901273	13,22	1
04106901273	14,70	2
04106901280	14,52	1
04106901280	17,05	2
04106901281	12,23	1
04106901281	19,06	2
04106901283	21,40	1
04106901283	21,07	2
04683501686	21,47	1
04683501686	19,09	2

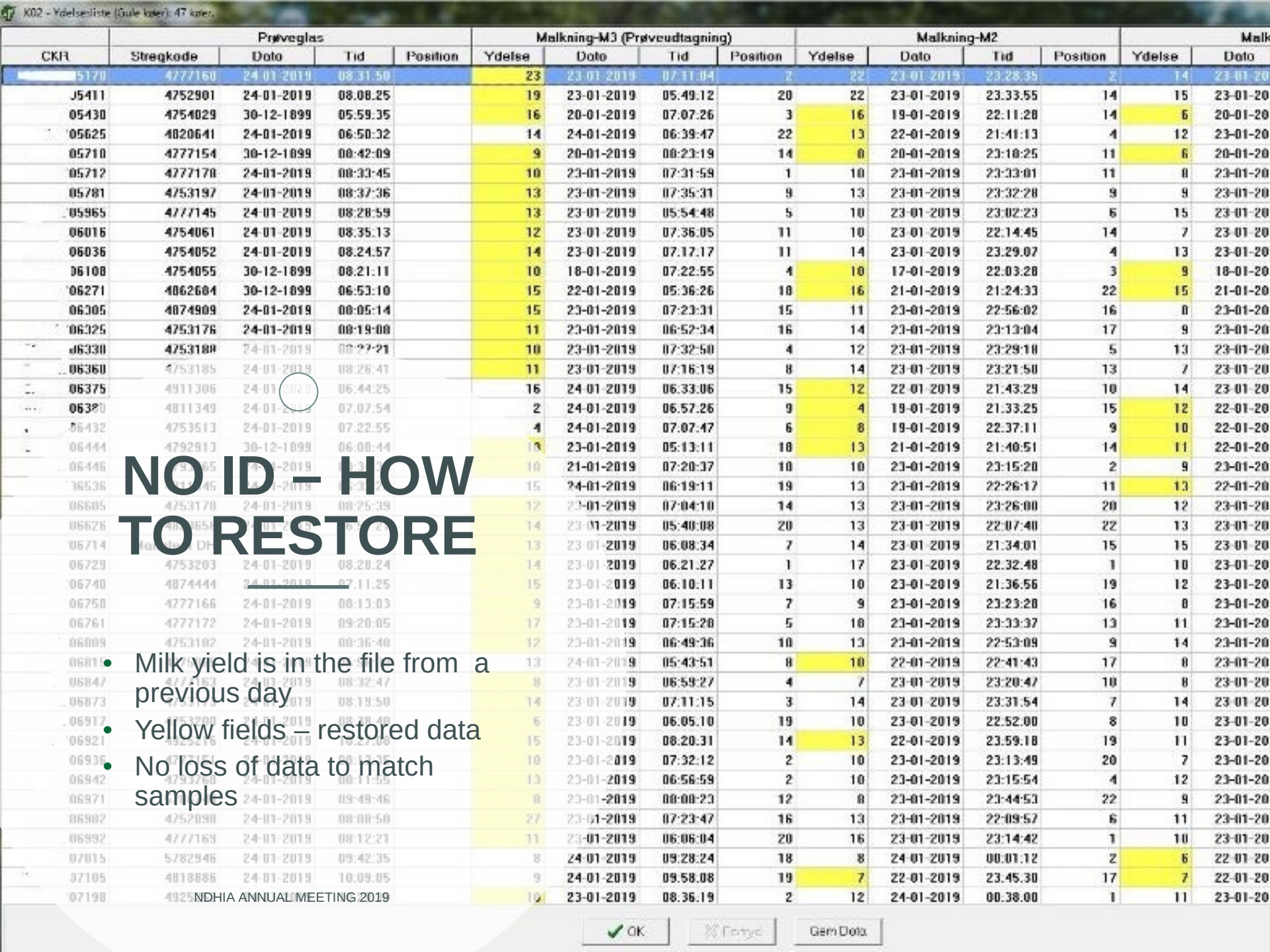
```
AD;25;12;04730102678M;4141043;0;0080;0000;00;00;182742;182742;0;x
AD;25;13;03929002084M;4141040;0;0080;0000;00;00;182743;182743;0;x

------------------------------------------------------------
Prøveudtagning:
05-12-2018 14:55:00 - 05-12-2018 19:47:00 Antal prøver: 373
------------------------------------------------------------
PC Malkninger:
04-12-2018 02:43:25 - 04-12-2018 07:02:57 Køer malket : 356
04-12-2018 14:55:00 - 04-12-2018 19:47:00 Køer malket : 383
05-12-2018 02:40:00 - 05-12-2018 07:04:07 Køer malket : 335
05-12-2018 14:55:00 - 05-12-2018 19:46:00 Køer malket : 367 MP
06-12-2018 02:38:00 - 06-12-2018 07:04:06 Køer malket : 328 M
------------------------------------------------------------
```

TESTDAY – MALFUNCTION OF ANTENNA

K02 information. <Ydelses fejl> <Stregkode fejl> <Malknings fejl> (57)

CKR	Ydelse	Prøveglas	Position	Start tid
05170	0,00	4777160	0	08:31:50
05411	0,00	4752901	0	08:08:25
05430	0,00	4754029	0	05:59:35
05625	0,00		0	00:00:00
05710	0,00	4777154	0	08:42:09
05712	0,00	4777178	0	08:33:45
05781	0,00	4753197	0	08:37:36
05965	0,00	4777145	0	08:28:59
06016	0,00	4754061	0	08:35:13
06036	0,00	4754052	0	08:24:57
06108	0,00	4754055	0	08:21:11
06271	0,00	4862684	0	06:53:10
06305	0,00	4874909	0	08:05:14
06325	0,00	4753176	0	08:19:08
06330	0,00	4753188	0	08:27:21
06360	0,00	4753185	0	08:26:41
06371	0,00	4754367	0	07:36:13
06375	0,00		0	00:00:00
06380	0,00		0	00:00:00
06380	0,00		0	00:00:00
06432	0,00		0	00:00:00
06432	0,00		0	00:00:00
06444	0,00	4792913	0	06:08:44
06446	0,00	4793765	0	08:34:36
06462	0,00		0	00:00:00
06462	0,00	4875044	0	05:54:04
06536	0,00		0	00:00:00
06554	0,00	4875047	0	05:55:23
06605	0,00	4753170	0	08:25:39
06626	0,00	4820656	0	06:51:21
06714	0,00		0	00:00:00



NO ID – HOW TO RESTORE

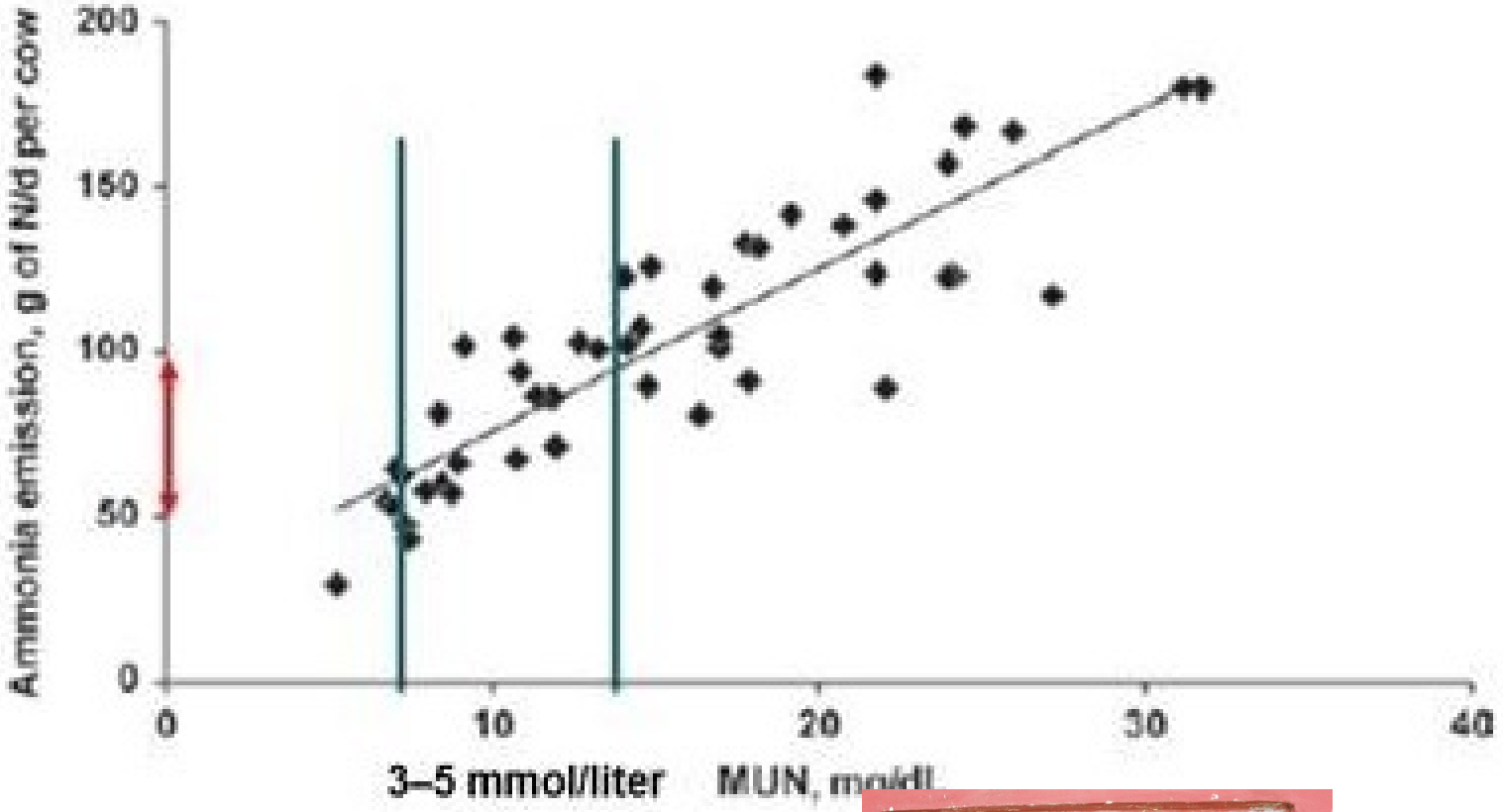
- Milk yield is in the file from a previous day
- Yellow fields – restored data
- No loss of data to match samples

ANALYSIS OF UREA IN MILK

- The Danish Agriculture & Food Council encourage farmers to lower N emmision.
- Milk samples is an important tool to support this
- DHI is a natural way to collect valuable data

ANALYSIS OF UREA IN MILK

- Urea in milk is a way to measure the protein utilization
- If we can bring down the level of MUN then the N emission from the Danish farms can be lower
- Lower emission supports public acceptance of dairy farming



HIGH LEVEL OF MUN IN THE MILK GIVES HIGH AMMONIA EMISSION

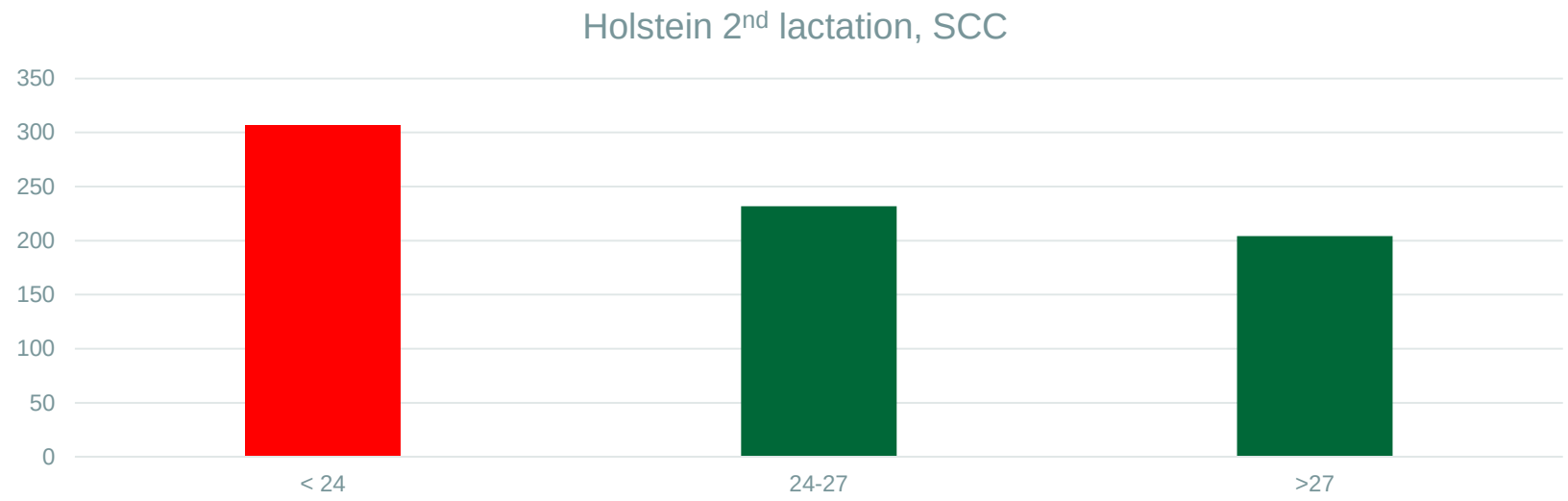
ANALYSIS OF FATTY ACID IN MILK

- Project FA data collection 2015-2016
- Report published 2016
- Full part of DHI samples from January 2019
- Fatty acid as a reference to feeding and cow welfare
- Rumen function is reflected in composition of fatty acids
- Fatty acids is a tool to monitor feeding

FATTY ACID

- Inspired by Dr. Barbanos work about fatty acid as a indicator for rumen health
- Danish data from SOB cow project find limit for level of de novo fatty acid in danish condition
- 24 g de novo fatty acid / 100 g fat for Holstein
- 28 g de novo fatty acid / 100 g fat for Jersey

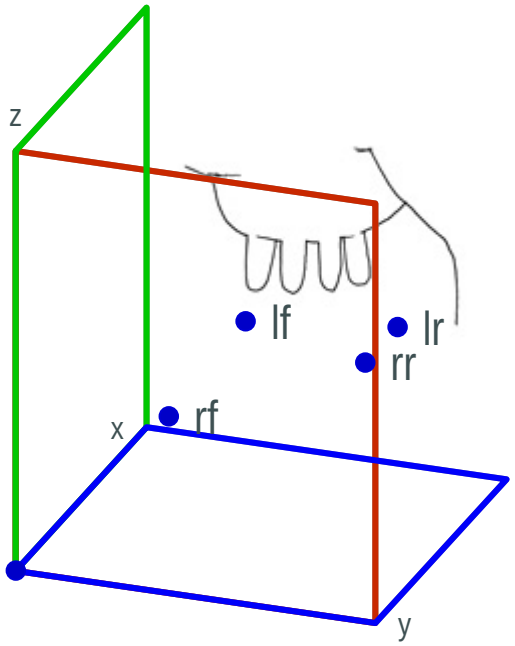
THE LOWER LEVEL OF DE NOVO FATTY ACID, THE HIGHER SOMATIC CELL COUNT



UDDER CONFORMATION

- **Udder conformation is already evaluated**
  - Classified by experienced classifiers
- **115,000 Danish cows are classified per year**
  - The majority of the cows are 1st parity cows
- **Information on teat co-ordinates in genetic evaluation is in place**

UDDER CONFORMATION BY TEAT CO-ORDINATES



- Front teat placement
- Rear teat placement
- Distance, front - rear
- Udder balance
- Udder depth, tip of the teat - measuring point

SUMMARY

- Milk sampling is our nerve
- Milk sample is our key product
- Data is next to come
- Dealing with cow ID is a challenge
- Sensors are slowly moving in

THANKS FOR YOUR ATTENTION