Detection of Pregnancy-Associated Glycoproteins in Routine Milk Recording Samples

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RUMINANTS
WIEDERKÄUER
RUMINANTS
RUMIANTES
反刍动物
反芻動物

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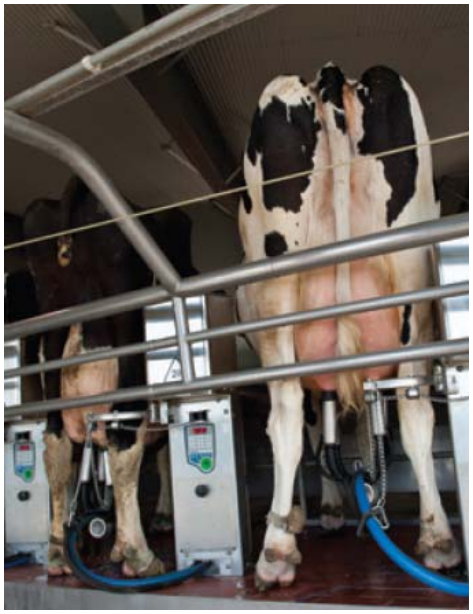
Overview

- Pregnancy-Associated Glycoproteins (PAGs): Ideal markers of pregnancy in cattle (ruminants)
- IDEXX Milk Pregnancy Test detects PAGs in routine DHI samples.
- Trial to investigate carry-over of PAGs in different milking systems
- Paired hand-stripped and routine DHI samples collected from each cow same day
- Only milk from cows ≥ 28 days post breeding included

Conclusions



- Slight carry-over in DHI samples possible
- Should be addressed when implementing pregnancy testing
- Carry-over can cause false positive results
- IDEXX Milk Pregnancy Test is an effective and economic tool for pregnancy testing using DHI samples from 28 days post breeding
  - Facilitates workflow on the farm
  - Cows do not need to be fixed for pregnancy diagnosis

IDEXX in the Dairy Industry

- Since ≥ 30 years laboratories, processors, veterinarians and producers use IDEXX diagnostic tests and technologies.
- IDEXX has proven solutions to help the industry achieve this goal.
- **IDEXX SNAP®** tests keep antibiotics out of the supply chain
- **IDEXX diagnostic tests** help manage disease
- **IDEXX pregnancy tests** maximize production

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Landeskontrollverband Weser-Ems e.V.

- 383‘000 cows on milk recording
- 4‘470 farms
- 325 controllers
- 20 employees in 5 locations
- Milk performance
- Milking analysis and milking technique control
- Herdmanagement software
- Part of LKV Niedersachsen with 765‘000 cows on milk recording and 8‘800 farms

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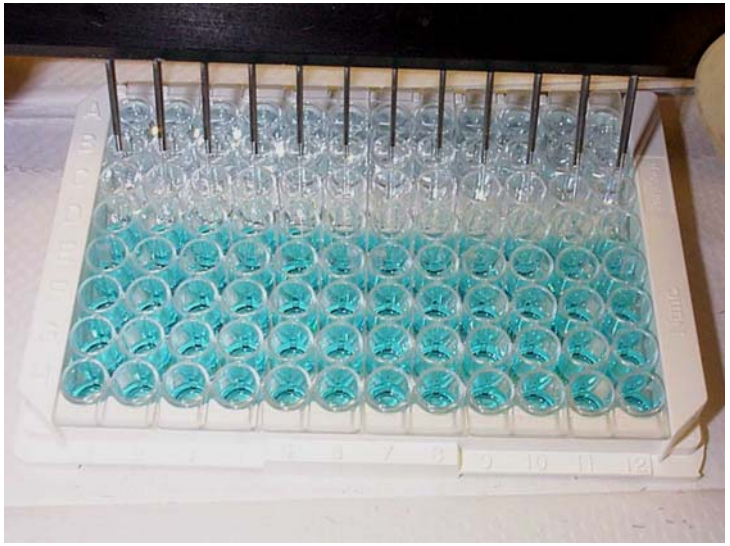
DHI laboratory Weser-Ems

- 2014 total 5.26 mio samples analyzed
  (4.11 mio DHI samples)
- 60 employees
- DHI testing
- Pathogen detection
- Quality Management Milk
- Sample collection for governmental testing
- Pregnancy testing

Goal of Study

- Investigate potential of carry-over in different milking systems with different DHI sample collection systems.
- Carry-over: overflow (or remaining milk volume) from previous cow can influence test result of sample from next cow.



Study Farms

- 5 farms (3: TruTest, 1: GEA Metatron, 1: AMV Lely A3)
- Average herd size 116 cows (58 to 182)
- Average number of cows in milk 104 (51 to 161).
- Reproduction: all AI, one farm with additional bull breeding
- Year round calving
- Milking independent from performance or stage of lactation
- Animal IDs clear and traceable

Overview and Technical Detail

Farm	Parlor	Milk Meter	Cows (total - milking)	Per-formance
A	Fishbone (2x8)	TruTest HI	119 - 106	9‘616 kg
B	Tandem (10)	TruTest HI	142 - 126	8‘626 kg
C	Rotary (24)	GEA Megatron	182 - 161	10‘317 kg
D	Tandem (7)	TruTest HI	81 - 75	9‘825 kg
E	Robot	Lely Shuttle	58 - 51	10‘452 kg

Study Design - Samples

- Sample collection (during same milking event) between August 6 and September 12, 2014
- Milking position of every cow recorded
- Each cow pre-milked by farmer, then collection of hand-stripped samples from at least one quarter.
- Collection of DHI sample at the end of milking and milk volume recorded

Study Design - Testing

- Milk sample collection and documentation by LKV Weser-Ems e.V.
- All samples tested with IDEXX Milk Pregnancy Test within one day after collection
- Ultrasound check done by vet on relevant cows with recheck result or discordant paired sample result
- Relevant cows:
  ≥ 28 days post breeding, no heat and ≥ 60 days post calving

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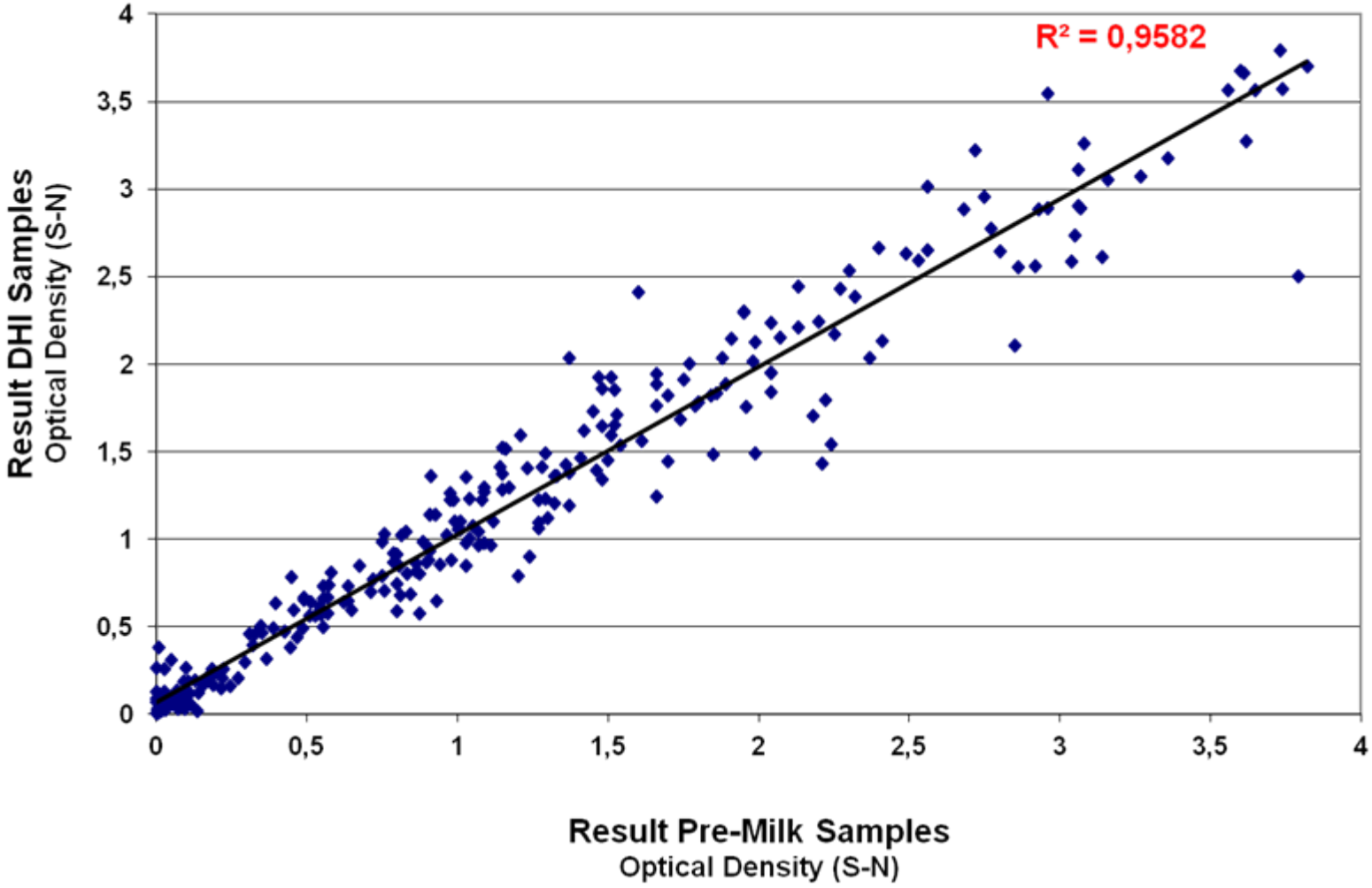
Results

- Overall comparison of OD values of paired pre-milk and DHI samples showed high correlation (R^2 = 0.9582)
- Farms A-D: 4,7 % of the cows (12 out of 257) samples showed carry-over (Pre-milk and DHI sample result mismatch)
- Farm E (robot): 7,3 % of the cows (4 out of 55) showed carry-over

Pre-Milk and DHI Sample Comparison



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Carry-Over Relevant Cows
(≥ 28 Days Pregnant)

Farm	Total Tested	Matching	Carry-Over
A	66	65	1 (1.5%)
B	72	68	4 (5.6%)
C	80	79	1 (1.3%)
D	39	33	6 (15.4%)
A-D	**257**	**245**	**12 (4.7%)**
E	55	51	4 (7.3%)

Carry-Over Data Relevant Cows (6 of 12)
(≥ 28 Days Pregnant)

Cow ID	Days post Breeding	Result previous Cow*	DHI* / Pre-Milk*	Ultra-sound Check
Ella	107	3.790	0.377 / 0.009	Open
Klara	50	1.860	1.810 / -0.007	Open
Almara	34	0.069	0.310 / 0.048	Open
Cissi	201	0.779	0.127 / 0.028	Open
Biotika	83	0.566	0.116 / 0.009	Open
Konni	37	-0.016	0.121 / -0.025	Open

* OD values (S-N), if ≥ 0.250: Pregnant,
if ≥ 0.100 and < 0.250: Re-check,
if < 0.100: Open

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Conclusions

- 4,7 % of the cows (12 out of 257) from conventional milking systems samples showed carry-over (Pre-milk and DHI sample result mismatch)
- 7,3 % of the cows (4 out of 55) from a milking robot system samples showed carry-over
- Carry-over can cause false positive results.
  False negative results have not been found.
- Slight carry-over in DHI samples cannot be excluded and should be addressed when implementing pregnancy testing