Pregnancy detection from milk samples obtained for routine milk yield measurements - results and evaluation -

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Recorded population with the method „A” in Hungary

1. 178.000 milk cattle → cca. 93 % HF

   → cca. 2% dual purp. (HS)

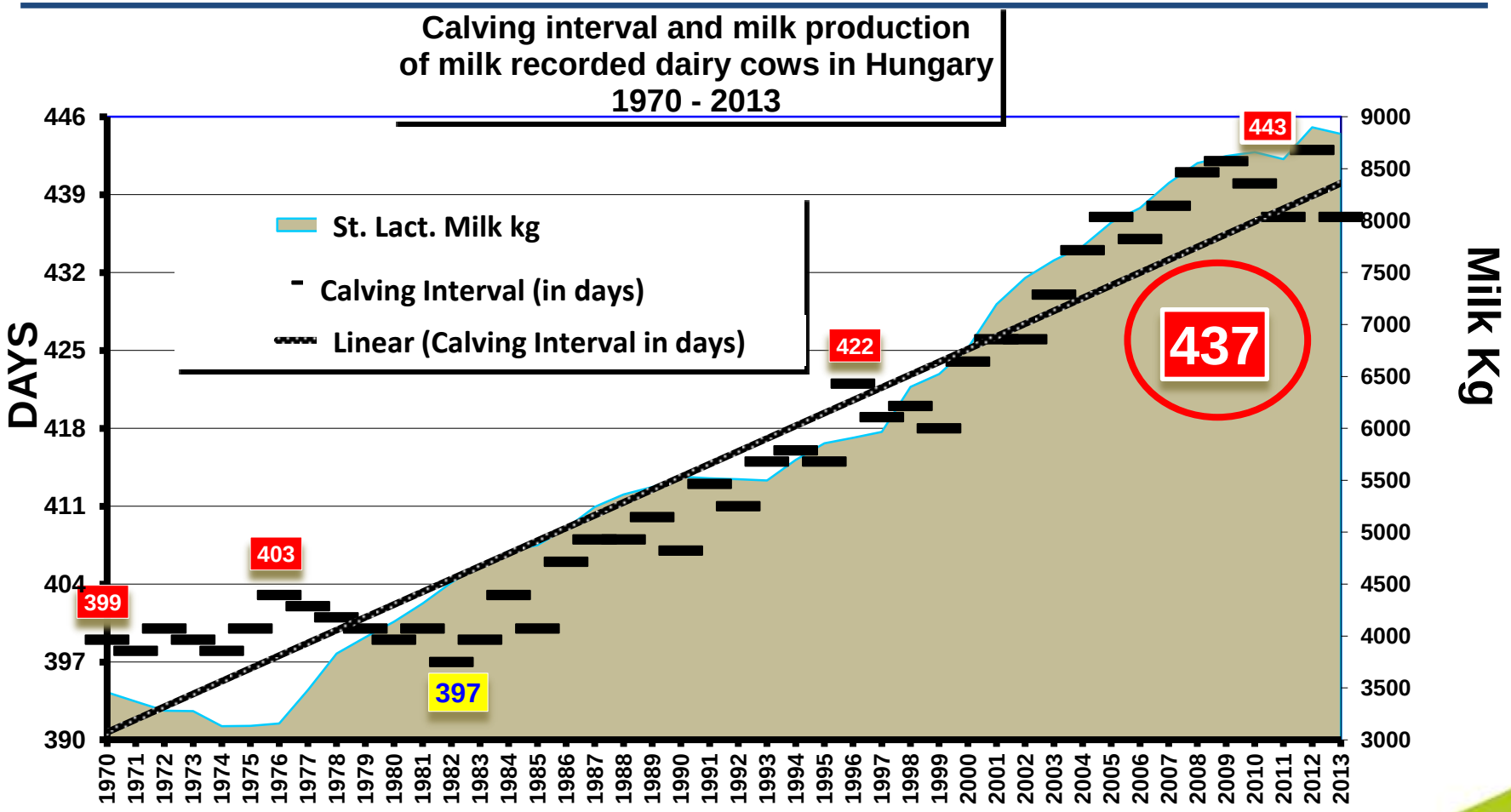
2. 461 herds

3. Average cow no./herd: 387

Livestock Performance Testing Ltd.

1. 3% of the potential milk producers- 20-26000 administrated farmers and herds- take part in the milk recording (method „A”).
2. 70-71% of the Hungarian dairy cattle population is recorded (method „A”).
3. This recorded population gives 80-85% of the Hungarian milk production.
4. 95-98% of the recorded population is tested for somatic cells 12 times per a year.

Trends in the calving interval



2014

Calving Interval	Farm	Average Milk yield (kg)
Less than 350 days	6	6507,7
350 - 380 days	11	6224,8
381 - 410 days	56	7586,0
411 - 440 days	179	8569,7
441 - 470 days	162	8500,7
471 - 500 days	52	7646,5
More than 500 days	40	7143,4
Total/Average	506	8155,7

Pregnancy tests

- Sensitive – Proper detection of pregnant cows
- Specific – reliable detection of empty cows
- Cheap
- It can be used as stall probe
- It is supposed to give appropriate diagnosis for the test date

- Rectal (ultrasound, palpation)
- **Blood** Chemical Assays (progesterone, PAG)
- **Milk** Chemical Assays (progesterone, PAG)

The embryonic death can distort the results.

What has been changed for 2 years?

N= 461	2012	2014	Change
Who does the insemination?			
Insemination technicians	365	344	↓
Vet	26	16	↓
Owner	17	24	↑
Detection of Pregnancy			
Insemination technicians	264	226	↓↓
Vet	111	127	↑
Method			
Palpation	287	240	↓↓
US	67	92	↑
Other	44	69	↑

Materials and Methods

1. Detection of **PAG**s (**P**regnancy **A**ssociated **G**lycoproteins) produced by the placenta with ELISA method (IDEXX Inc).

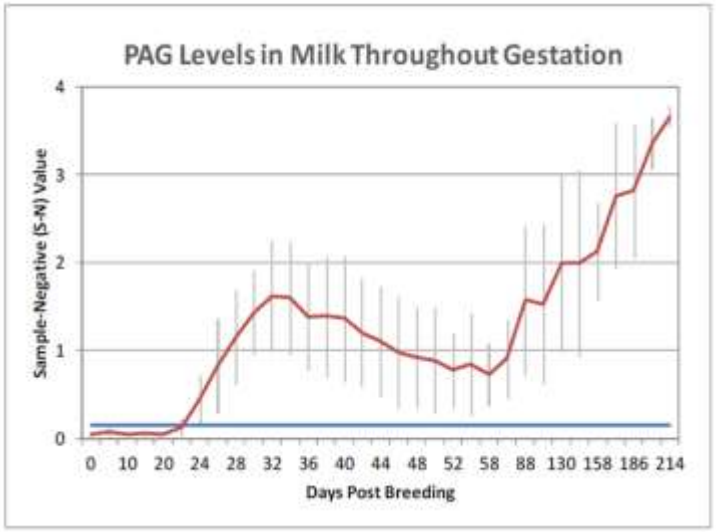
Materials and Methods

2. Important parameters for the testing:

- 35 (28) days after the insemination
- 60 days after the previous calving
- Unreliable results with mastitis infection

PAG levels in milk during the gestation

- Significant alterations in quantity and composition during the gestation.
- PAGs are detectable from the early period, till the end of the gestation.
- The cut off line of the method takes quantity indecisions into considerations.
- Significant level increase at the end of the gestation.



PAG Levels in Milk after the calving

- **The PAG level decreases rapidly after calving**
- **The protein depletes 60 days after the calving**
- **It does not interfere with the next gestation – insemination within 60 days from the previous calving. (13.649 animal of 175.412 live animals – 7,78%)**

Introducing PAG test into the routine performance testing

- **Milk sampling made by sample technicians (in the frame of animal recording- certainly it can be made more frequently),**
- **not necessary to hold and tie the animals,**
- **not invasive intervention,**
- **no extra delivery and sampling cost**
- **no extra labour needed**
- **fast and reliable results (within 48 hours)**

Technological description

- **Sampling together with the routine milk recording**
  - **Data preparation**
  - **Sampling**
  - **Laboratory**
  - **Evaluation, data providing**
  - **Reproduction lists**

- **Sampling with the control recording (between two test days)**
  - **Order form**
  - **LPT Ltd.**
- **Farm Sampling**
  - **directly to the Milk Laboratory**

Technological description

- Data capture
  - with data handler.
- Cow marking
  - with use of data handler.
- Consultation with the farmer.
- Change of vials
- Sampling

Results

1. 92 herds 27 823 cows (January, 2015).
2. 29 440 tests (January, 2015).
3. Only that pregnancies can be evaluated which running through the data processing - breeding data, Gold standard is -285 +/- 14 days
4. Error: less than 35 days from the date of insemination – no evaluation.

Administration of PAG samples (April 2013 - March 2014)				
Month	Number of samples	Pregnant	Open	Recheck
Tests Total				
2013.04-2014.03	14315	8288	5383	640 (4,47 %)
Via Milk testing Laboratory				
	6383	3174	2992	220
Via data processing				
	7932	5114	2391	420
Days in gestation				
0-35 days	394 (NE)	166 (NE)	199 (NE)	29 (NE)
35-45 days	2661	1368	1035	168
46-60 days	1901	1028	724	149
From 60. days	3066	2555	435	76
NE=No Evaluation				

Embryonic and fetal death

Early embryonic death	Late embrionic death	Early fetal death	Late fetal death	Abortion
0.-16. days	16.-42. days	42.-90. days	90.-150. days	from 150. days

Based on gestation days (passed time since AI in days). Pregnancy: 285 +/- 14 days

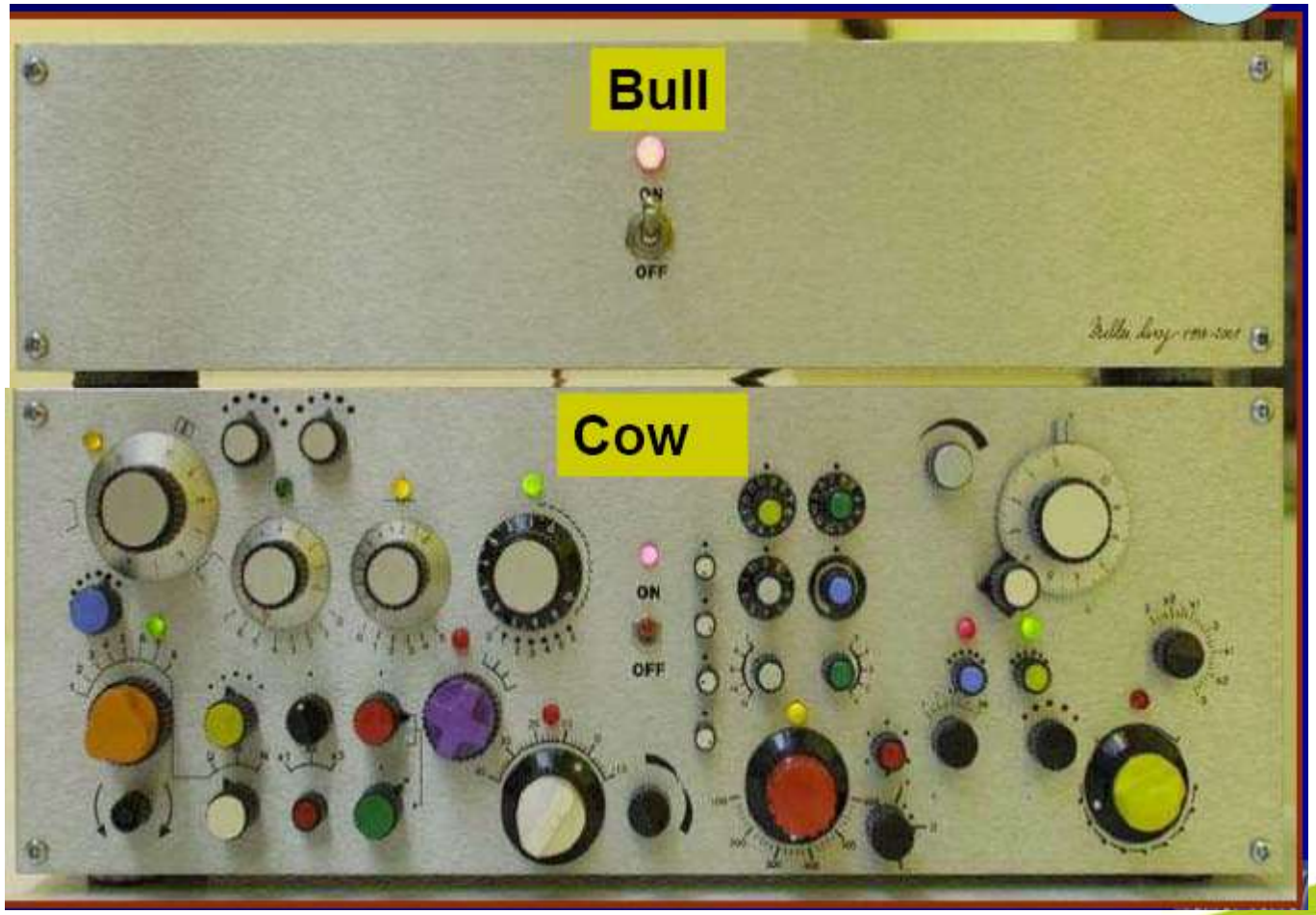
Days is gestation	PAG	Results of pregnancy examination			
		Results according to the reported calvings			
		Cows	Notification	Cows	
36-45 days	1268 pregnant	916	Calving on time		
		143	Fals notified date of AI		calving of earlier AI
		304	No calving	LATE EMBRYONIC DEATH ~ 16,32 %	
				97	culled, or out of recording
	1035 empty	1028	empty		99,32%
		7	pregnant		
	168 recheck	6	pregnant		
		162	empty		

Based on gestation days (passed time since AI in days). Pregnancy: 285 +/- 14 days	Days is gestation	Results of pregnancy examination				
		PAG	Results according to the reported calvings			
			Cows	Notification	Cows	Remark
	46 - 60 days	1028 pregnant	728	Fals notified date of AI		
			102			calving of earlier AI
			148		EARLY FETAL DEATH ~ 8,85 %	
					57	culled, or out of recording
		724 empty	720	empty		99,44%
			4	pregnant		
		149 recheck	40	pregnant		
			109	empty		

Based on gestation days (passed time since AI in days). Pregnancy: 285 +/- 14 days	Days is gestation	Results of pregnancy examination				
		PAG	Results according to the reported calvings			
			Cows	Notification	Cows	
	More than 60 days	2555 pregnant	2172			
			239	Fals notified date of AI		calving of earlier AI
			144		EARLY FETAL DEATH 2,66 %	
					76	culled, or out of recording
		435 empty	430	empty		98,85%
			11	pregnant		
		76 recheck	26	pregnant		
			50	empty		

It is not easy to improve the results

Cows are complicated animals



Thank You for your attention!