KNOWLEDGE CENTRE FOR AGRICULTURE

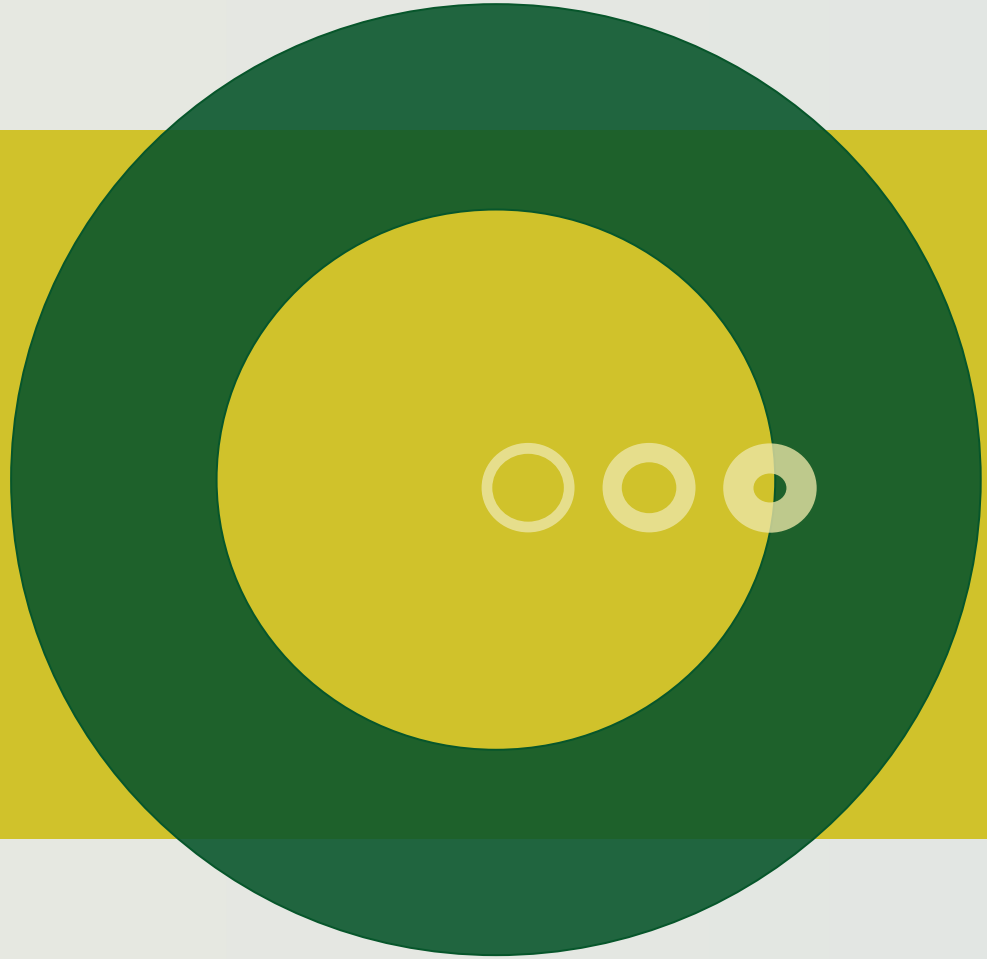
Prognosis of Dairy Production – a tool to improve planning on dairy herds

A2

Information for Profitable Dairy Farming - Management & Health

Cork 2012

Johannes Frandsen



PARTNER IN DLBR.

Important questions managing a dairy production

To know the expected production is a key issue!

Questions that needs an answer:

- How will the production be next year?
  - Can I increase the milk production?
- Do I have to buy animals?
- Or can I sell animals?
- What will the effect be if I improve reproduction management?
- And lots of similar questions..

And maybe the most important…

- How can I convince my financial partner (bank etc.) that my production is on track?

Answers

You can use last years productions results

- Expect the same production per unit…

Or use the detailed information from the cattle database on:

- Milk production per cow
- Latest milk recording per cow
- Management information
  - Production level
  - Reproduction
  - Health
- Knowledge about lactation curves achieved on the specific breed

The data back ground for the Prognosis is found in the Danish Cattle Database

Data from different sources

- Mandatory recordings
- Voluntary recordings
- Recordings from service suppliers (AI, Vets etc.)
- Dairies
- Slaughter houses
- Etc.

Data in the Danish Cattle Database - single animals

Red = Data required by law

Yellow = Registration must be available at control

Grey boxes = Via the IT-system of external partners

Blue boxes = Calculated via data in the Danish Cattle Database

( ) = Data provider

Ear tag
Calculation of descent and breed (ear tag manufacturers Cattle Database)

Calving/ birth (farmer)

Pregnancy (inseminator veterinarian farmer)

Drying off (farmer)

Calculation of salmonella level (Cattle Database)

Entry (farmer)

Weighing (farmer)

Slaughtering
Entry for slaughter, slaughter weight, form, fatness, colour, category (slaughterhouse, slaughterhouse manager via KF)

Exit (farmer)

Claw trimming (claw trimmer farmer)

Destroyed or dead:
Entry to incineration plant (DAKA)

Stationing (farmer)

Diseases/ medicine (veterinarian farmer)

Veterinarian samples:
Salmonella, Para tuberculosis, PCR (Cattle Database Eurofins | Steins)

Milk production

Classification (Progeny inspectors)

Insemination (inseminator owner inseminator)

Fat, protein, cell count, etc.:
(yield control, milking equipment, Eurofins | Steins)

Insemination plan (Viking)

Breeding values (NAV)

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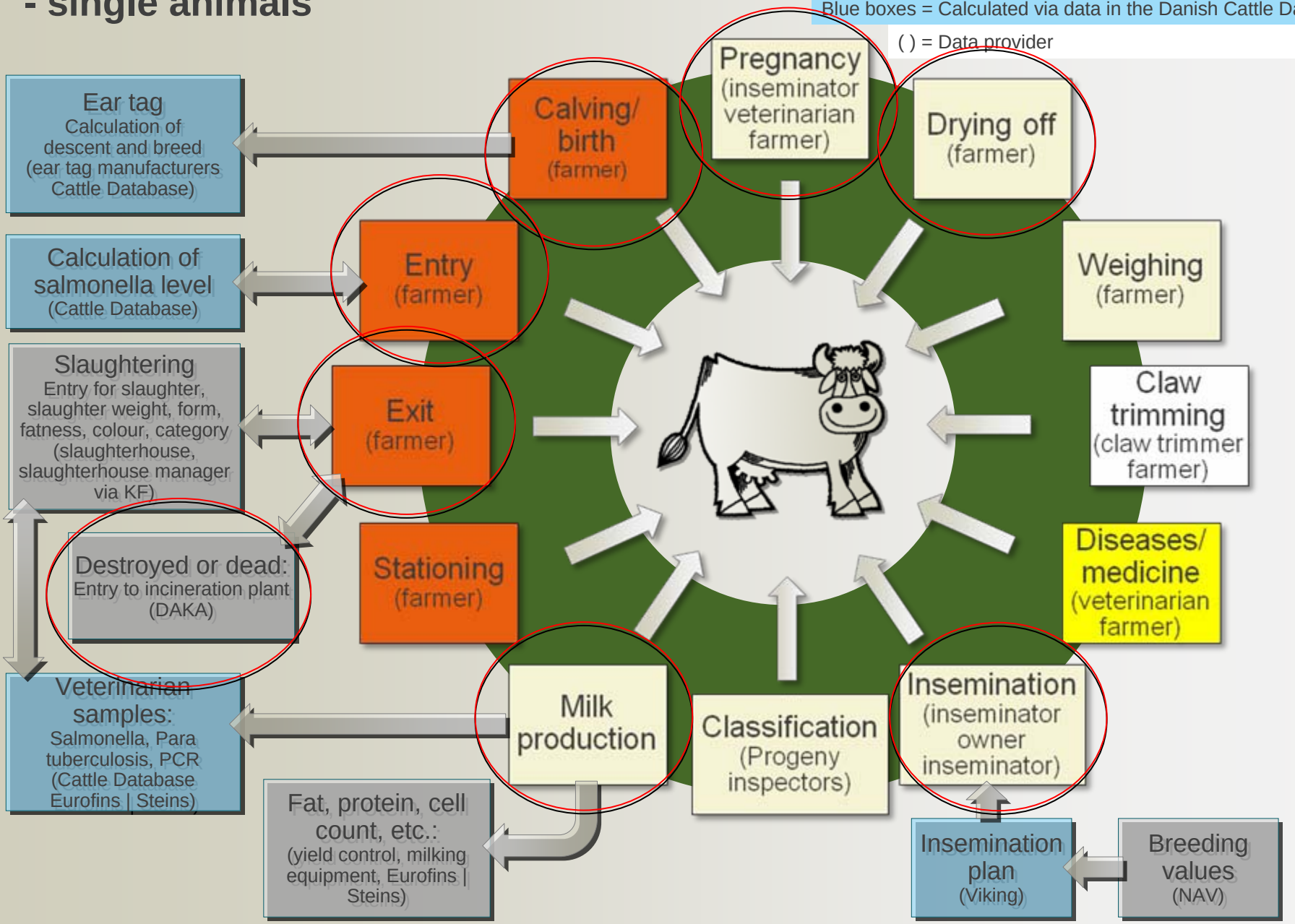

Data in the Danish Cattle Database - herd

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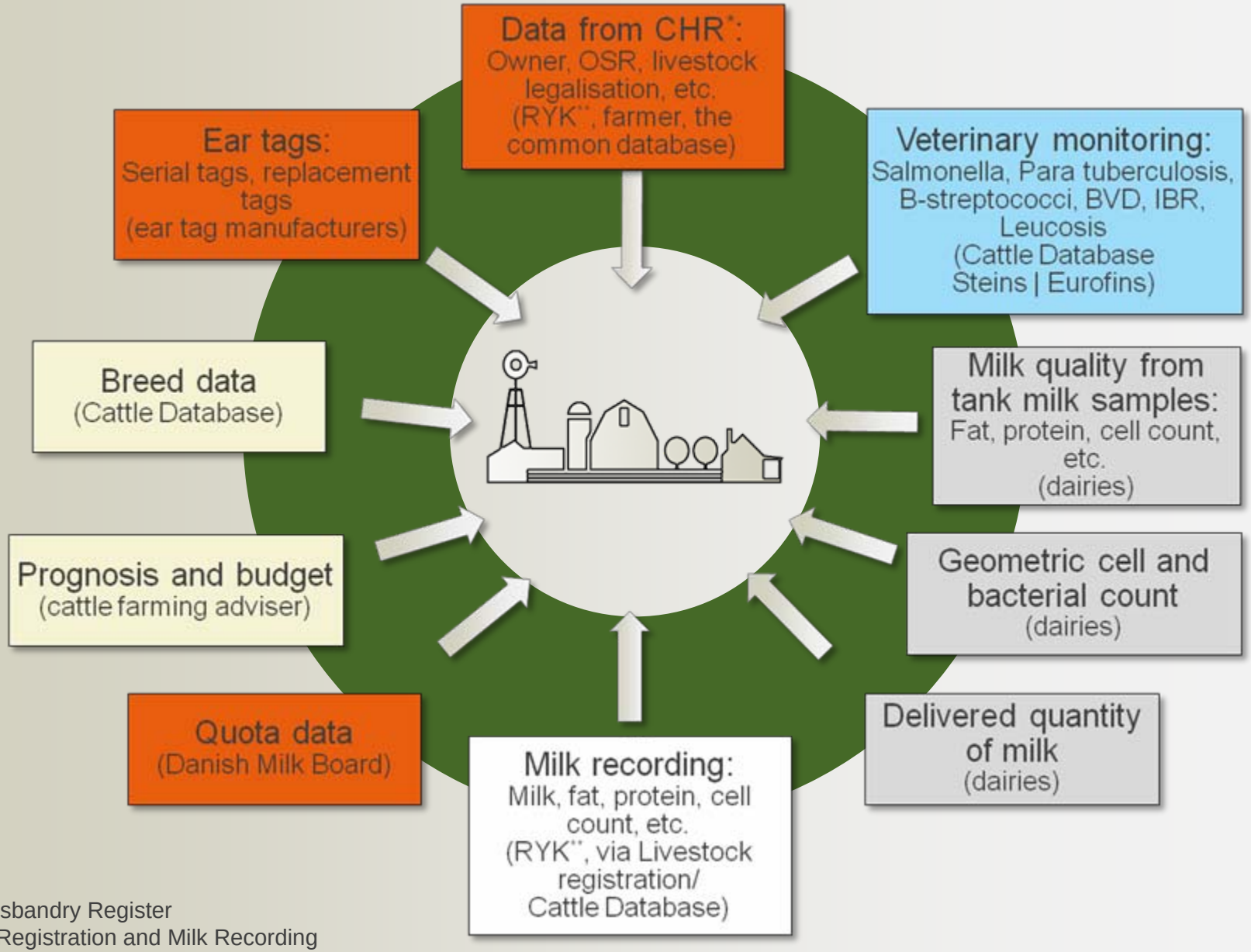

*CHR = Central Husbandry Register

**RYK = Livestock Registration and Milk Recording

Data in the Danish Cattle Database - herd

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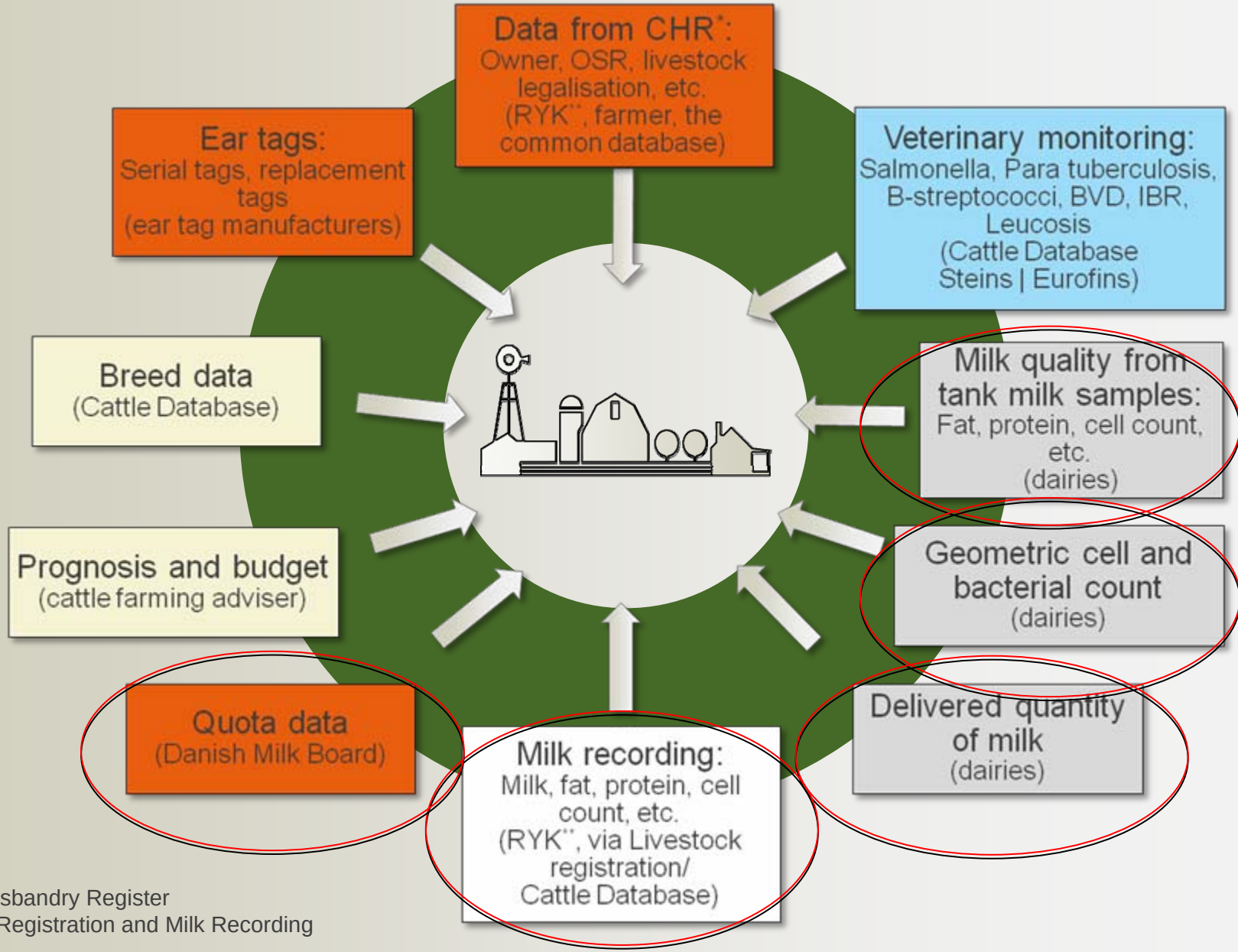

*CHR = Central Husbandry Register

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The tool - prognosis

- Input parameters
  - Herd key figures
  - Single cow yield recording results
- The Brain – Standard lactation curves
- Output
  - Milk production for the wanted period (up to 5 years)
  - Animals to sell, slaughter etc.

Advanced calculations – simple to use

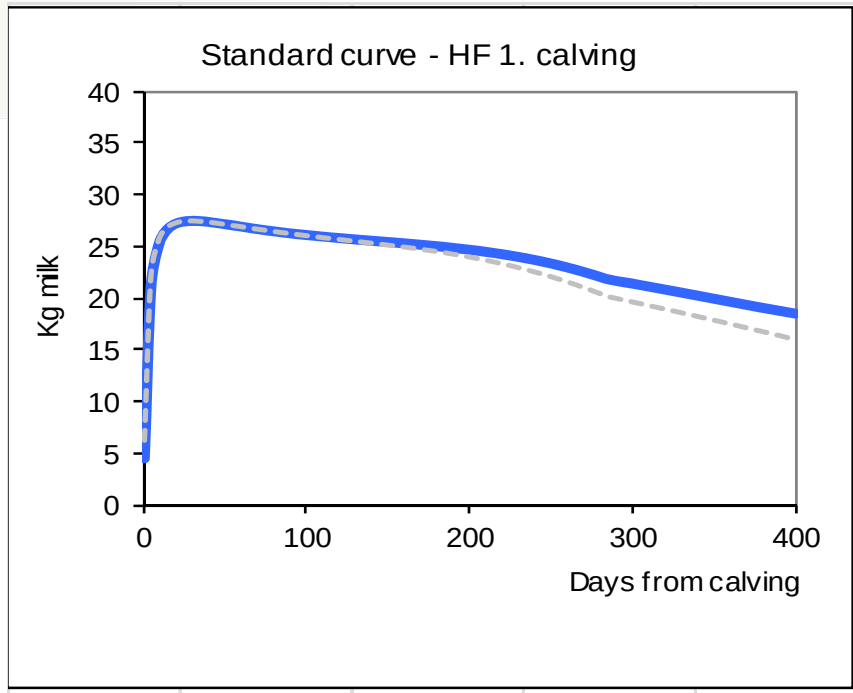
- Flexibility on input parameters

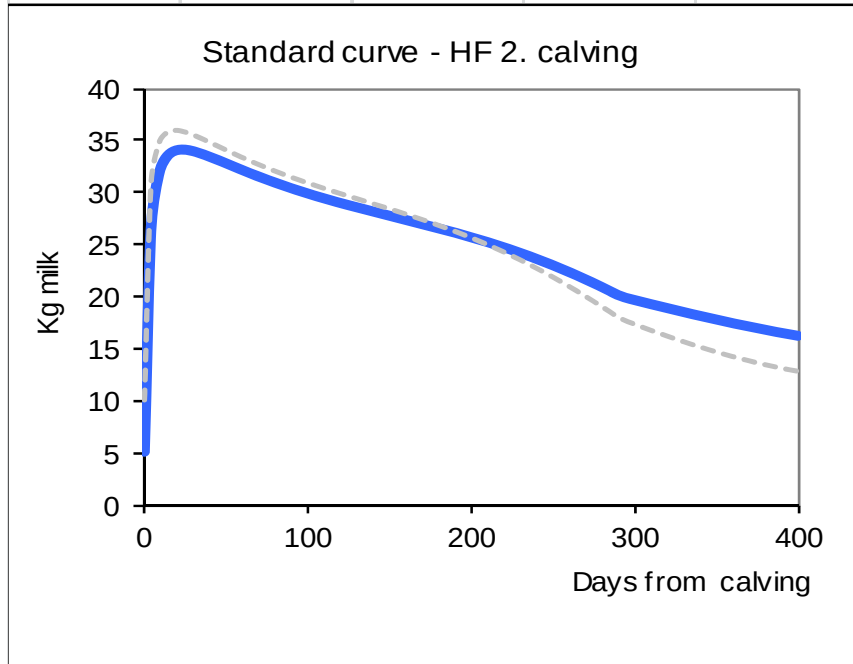
Standard lactation curves – the brain

- Developed first time back in 1992
- Statistical analyses of more than 300.000 lactations
- Standard curves described effected by a number of parameters
- Recalculated in 2002
- A new and more detailed version is planned to be implemented later 2012

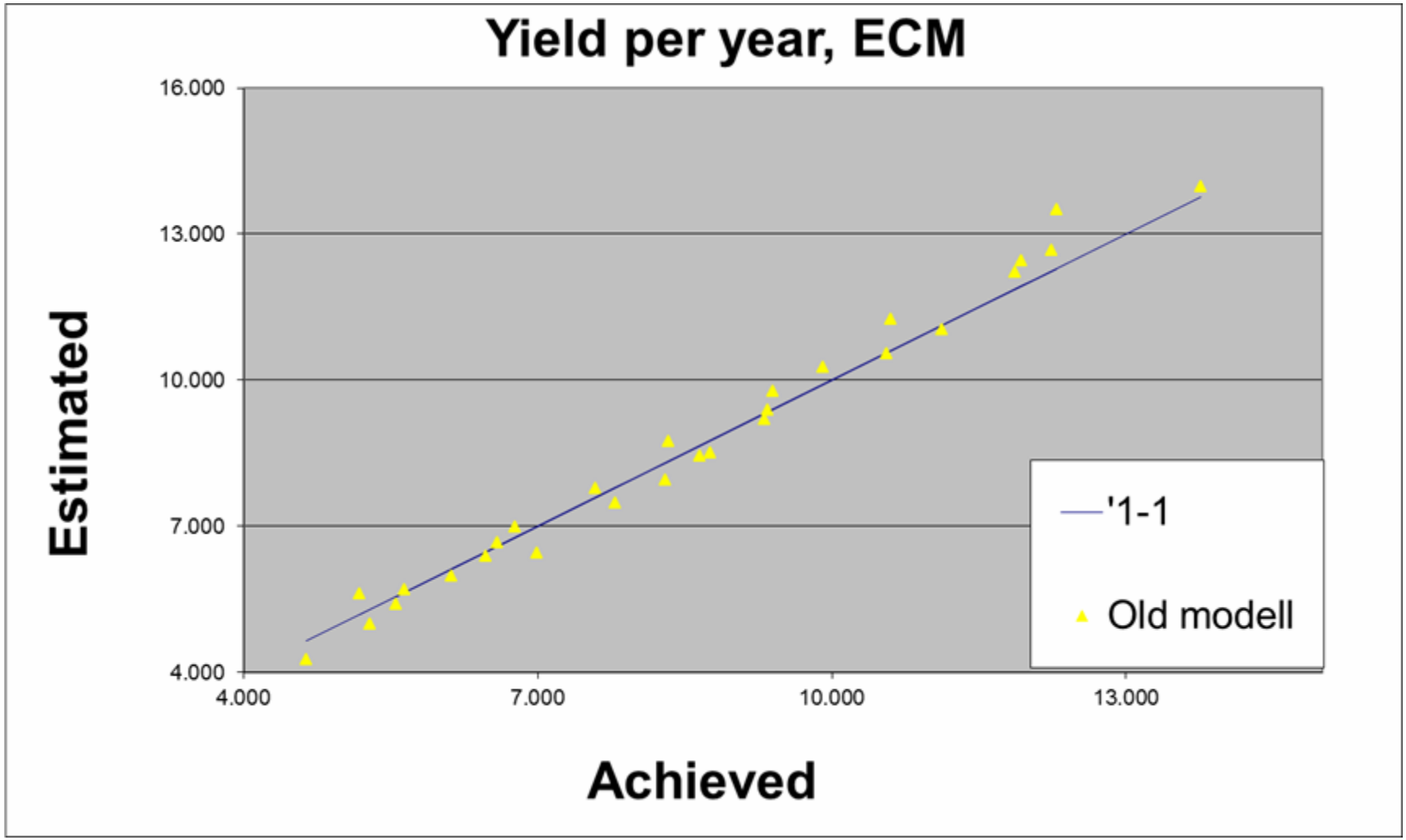
Std. lactation curves, input parameters:

- Breed
- Parity
- Lactation state
- Age 1. calving
- Repro status
- Calving month
- Performance of the cow (Yield, fat and protein)
- Production level of the herd





How well does the prediction fit?



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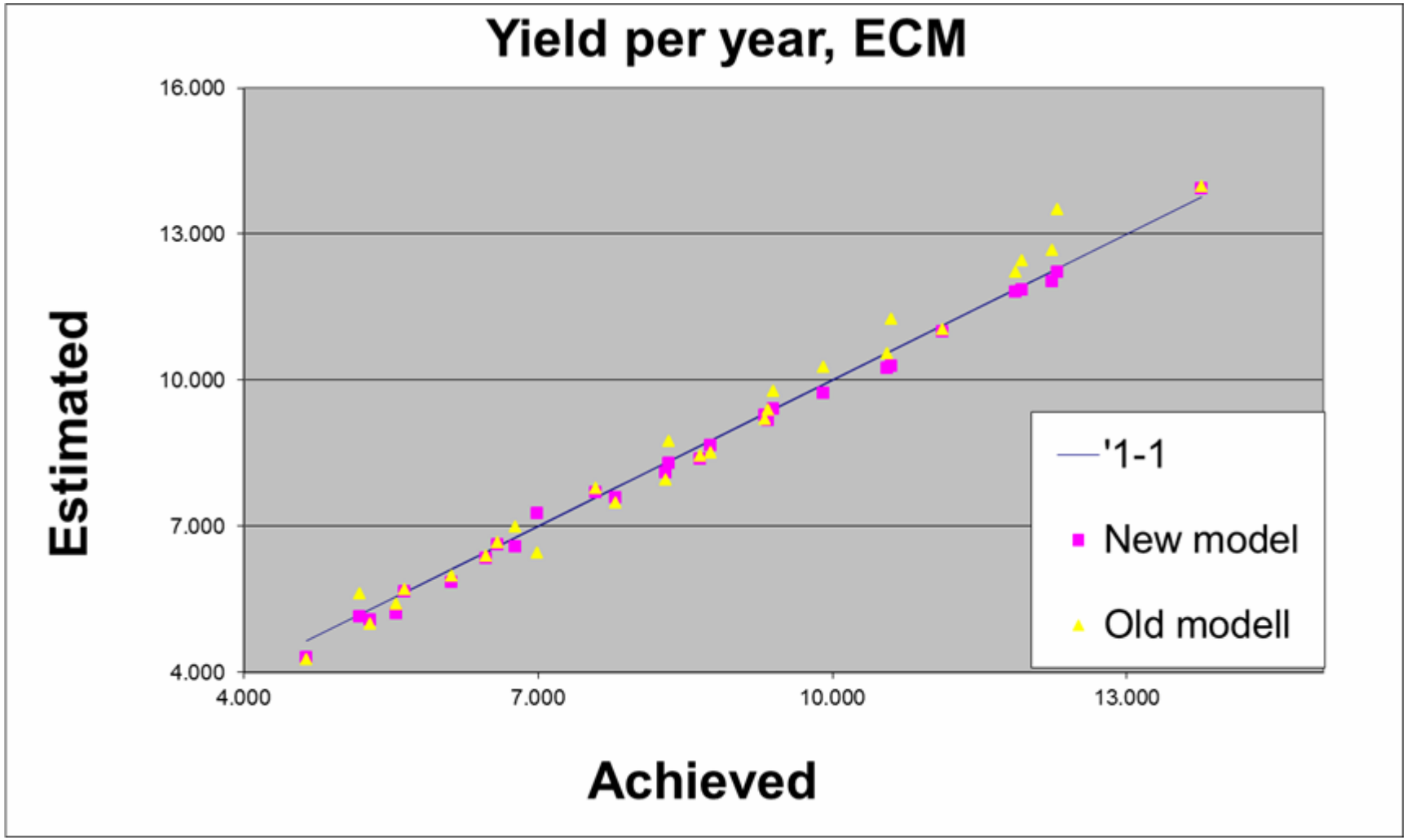
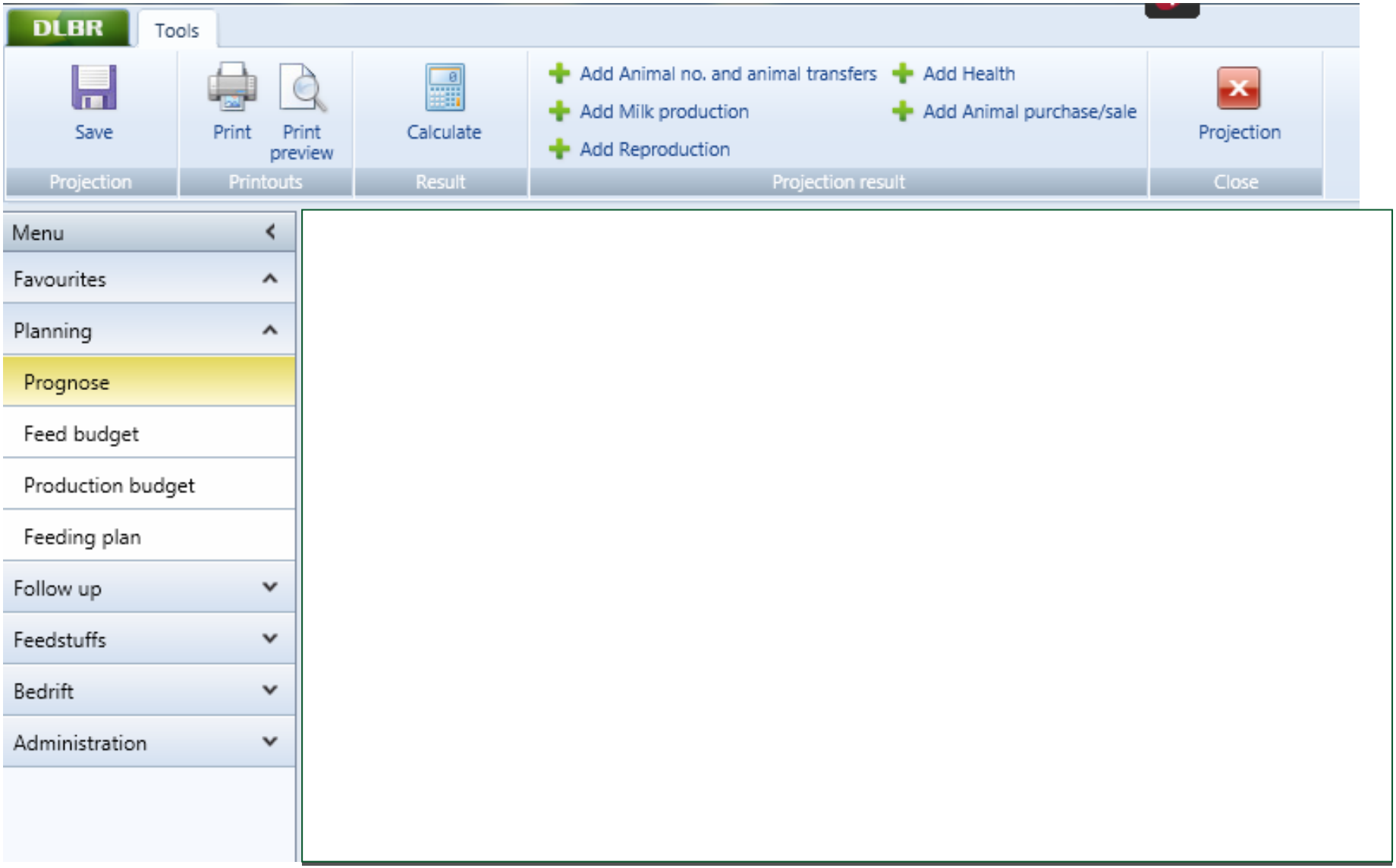
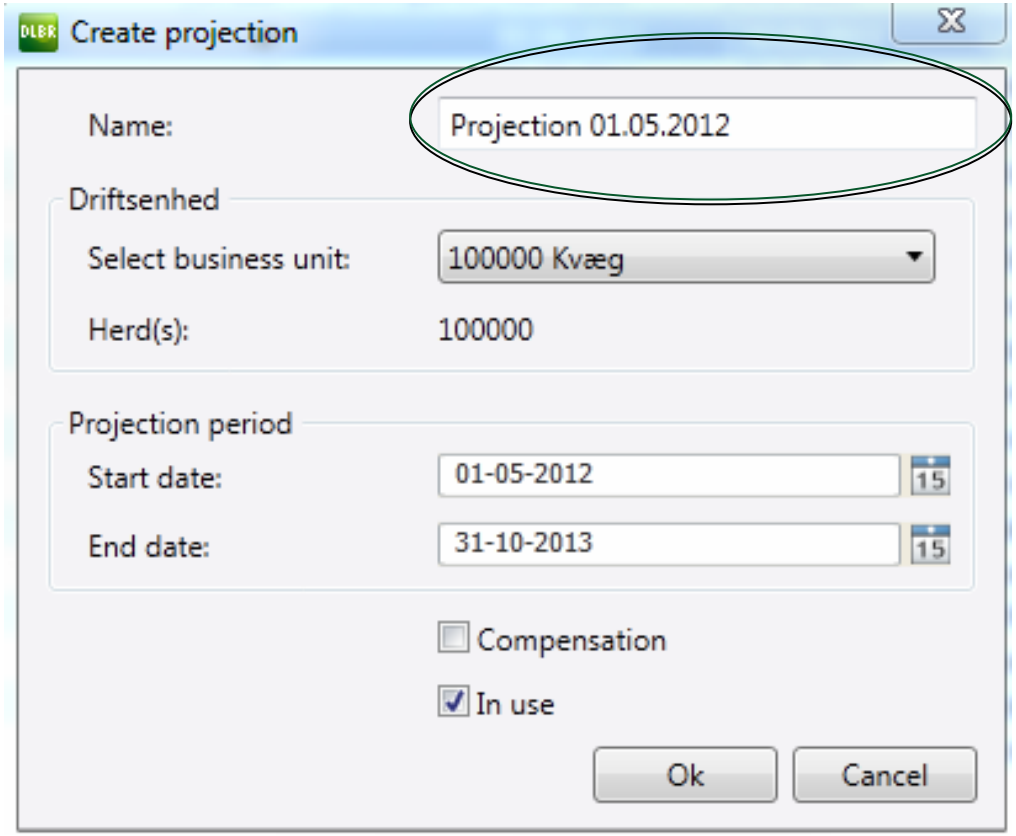


The DMS Framework



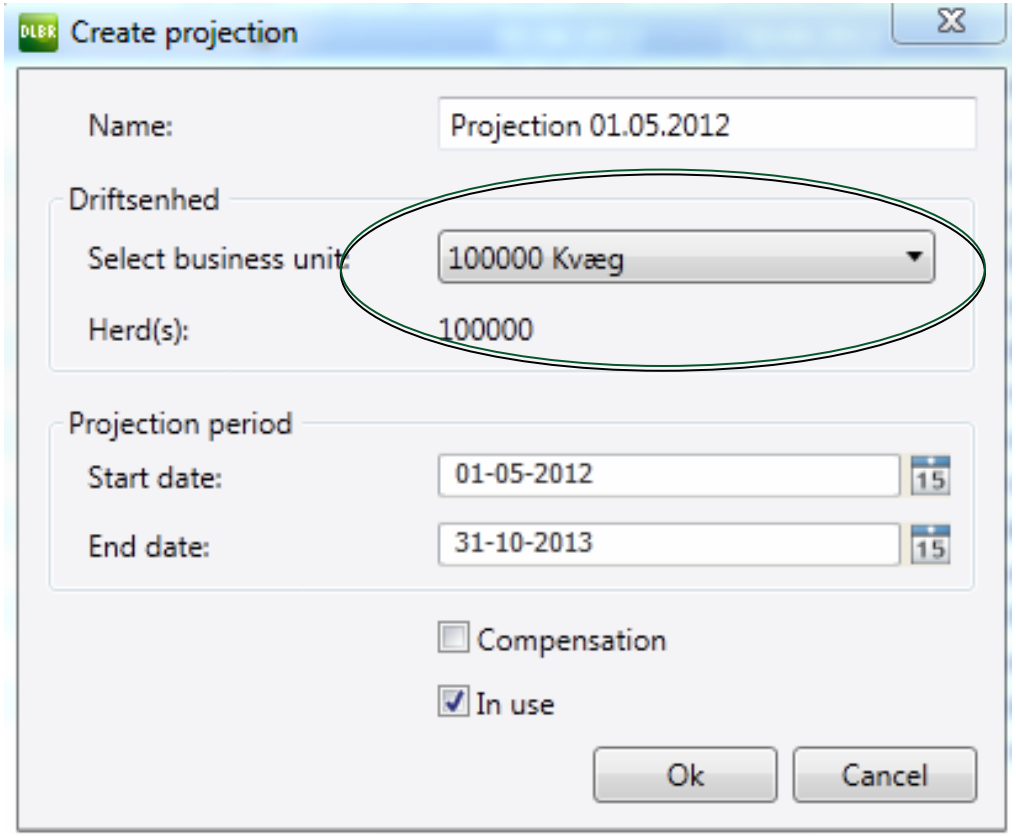
Upstart of prognosis



Selection of:

- Name

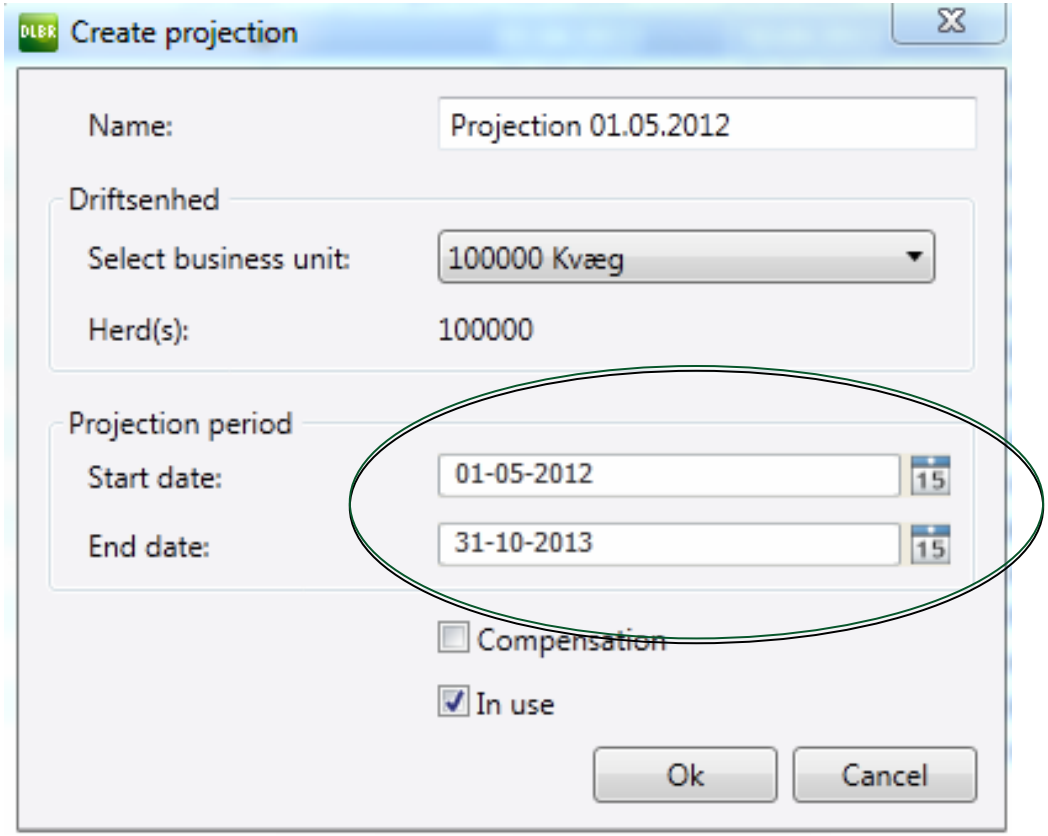
Upstart of prognosis



Selection of:

- Name
- Herd(s)

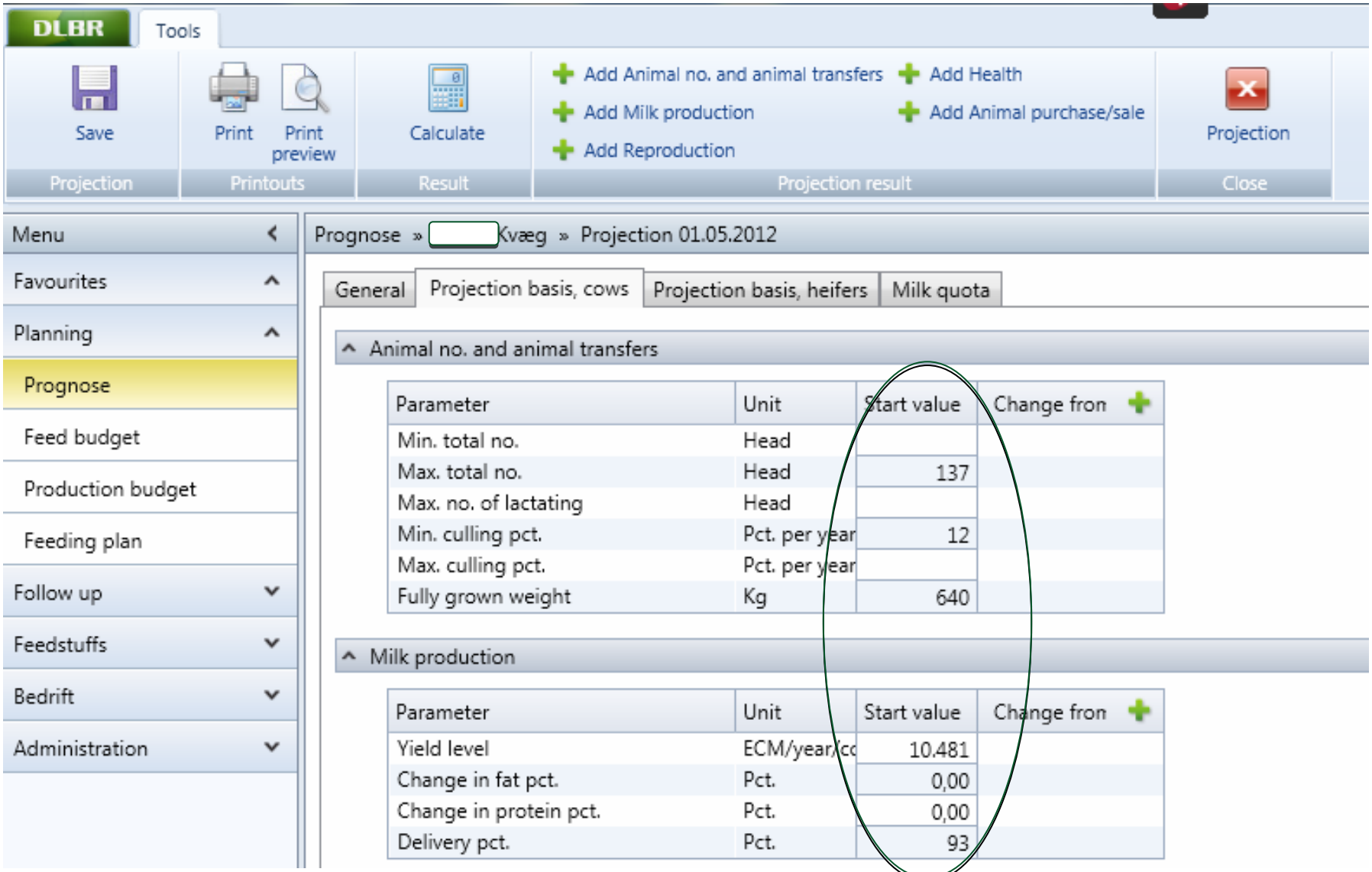
Upstart of prognosis



Selection of:

- Name
- Herd(s)
- Period

Selection of input parameters



Default input parameters can be edited

Animal no. and animal transfers

Parameter	Unit	Start value	01.08.2012	01.11.2012	Change fron
Min. total no.	Head				
Max. total no.	Head	137	**145**		
Max. no. of lactating	Head	**135**			
Min. culling pct.	Pct. per year	12		**8**	
Max. culling pct.	Pct. per year				
Fully grown weight	Kg	640			

Milk production

Parameter	Unit	Start value	01.10.2012	01.01.2013	Change fron
Yield level	ECM/year/co	10.481	**10.600**	**10.800**	
Change in fat pct.	Pct.	0,00			
Change in protein pct.	Pct.	0,00			
Delivery pct.	Pct.	93			

Default input parameters – reproduction and health

Reproduction

Parameter	Unit	Start value	Change fron
Anvendes foldtyr	Yes/No	☐	
Pregnancy check	Yes/No	☐	
Insemination pct.	Pct.	47	
Conception rate	Pct.	41	
Start ins. 1. calv.	Days from ca	49	
Start ins. others	Days from ca	54	
End ins. 1. calv.	Days from ca	229	
End ins. others	Days from ca	234	
Dry period, 1. calving	Days	**56**	
Dry period, others	Days	**42**	
Pct. sexed semen	Pct.	0	
Conception rate, sex select.	Pct.	0	

Health

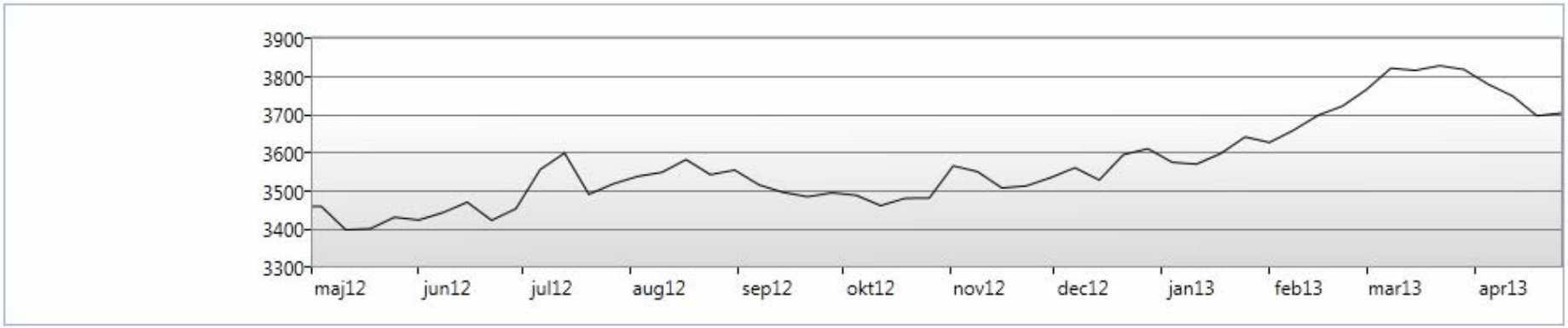
Parameter	Unit	Start value	Change fron
Mortality	Pct.	5	
Stillborn calves	Pct.	7	

The output

Parameter	Unit	Maj12	Jun12	Jul12	Aug12	S
ECM prod. per cow	Kg/day	27	27	27,7	27,8	
Milk deliv. to dairy	Kg/day	3418	3448	3540	3554	
Milk deliv. to dairy	Ton/mth	106	103	110	110	
Fat pct., dairy	Pct.	4,18	4,12	4,12	4,1	
Protein pct. dairy	Pct.	3,24	3,2	3,2	3,26	
Total no. at the end	Head	138	137	137	137	
No. of lact. end	Head	121	125	123	124	
Total calvings	Head	9	14	16	16	
1. calving calv.	Head	2	4	5	6	
Purchase	Head					
Slaughter	Head	1	4	4	6	
Sale of cows for live use	Head					
Dead	Head		1	1		

Prediction based on the “now-situation”

Kg milk dairy per day

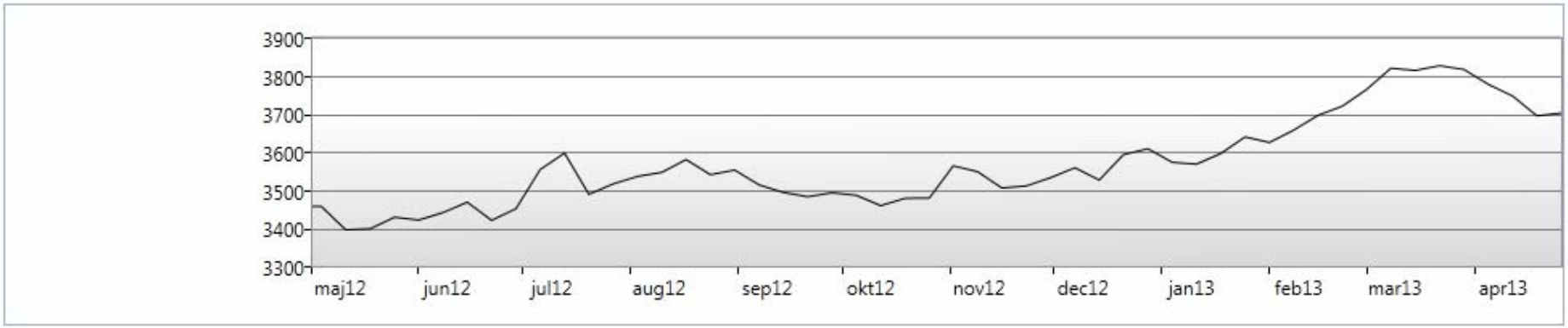


Month result

Parameter	Unit	Maj12	Jun12	Jul12	Aug12	Sep12	Okt12	Nov12	Dec12	Jan13	Feb13	Mar13	Apr13
ECM prod. per cow	Kg/day	27	27	27,7	27,8	27,7	28,1	28,7	29	29,2	30	30,3	29,8
Milk deliv. to dairy	Kg/day	3418	3448	3540	3554	3497	3491	3527	3572	3605	3700	3818	3723
Milk deliv. to dairy	Ton/mth	106	103	110	110	105	108	106	111	112	104	118	112
Fat pct., dairy	Pct.	4,18	4,12	4,12	4,1	4,12	4,21	4,28	4,23	4,25	4,31	4,17	4,2
Protein pct. dairy	Pct.	3,24	3,2	3,2	3,26	3,36	3,43	3,5	3,51	3,46	3,43	3,32	3,4
Total no. at the end	Head	138	137	137	137	137	138	137	136	139	137	137	137
No. of lact. end	Head	121	125	123	124	126	131	129	126	127	127	127	126
Total calvings	Head	9	14	16	16	13	14	12	9	14	14	8	13
1. calving calv.	Head	2	4	5	6	5	4	5	3	7	6	3	6
Purchase	Head												
Slaughter	Head	1	4	4	6	4	3	5	3	4	7	3	5
Sale of cows for live use	Head												
Dead	Head		1	1		1		1	1		1		1

Prediction based on the “now-situation”

Kg milk dairy per day



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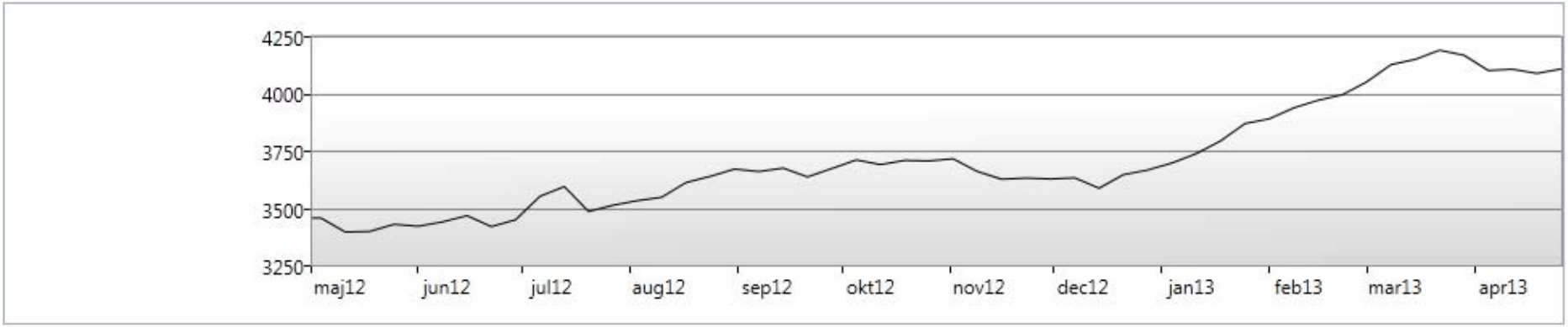
Milk deliv. to dairy	Ton/mth	106	103	110	110	105	108	106	111	112	104	118	112
Fat pct., dairy	Pct.	4,18	4,12	4,12	4,1	4,12	4,21	4,28	4,23	4,25	4,31	4,17	4,2
Protein pct. dairy	Pct.	3,24	3,2	3,2	3,26	3,36	3,43	3,5	3,51	3,46	3,43	3,32	3,4
Total no. at the end	Head	138	137	137	137	137	138	137	136	139	137	137	137
No. of lact. end	Head	121	125	123	124	126	131	129	126	127	127	127	126
Total calvings	Head	9	14	16	16	13	14	12	9	14	14	8	13
1. calving calv.	Head	2	4	5	6	5	4	5	3	7	6	3	6
Purchase	Head												
Slaughter	Head	1	4	4	6	4	3	5	3	4	7	3	5
Sale of cows for live use	Head												
Dead	Head		1	1		1		1	1		1		1

Prediction with strategic changes

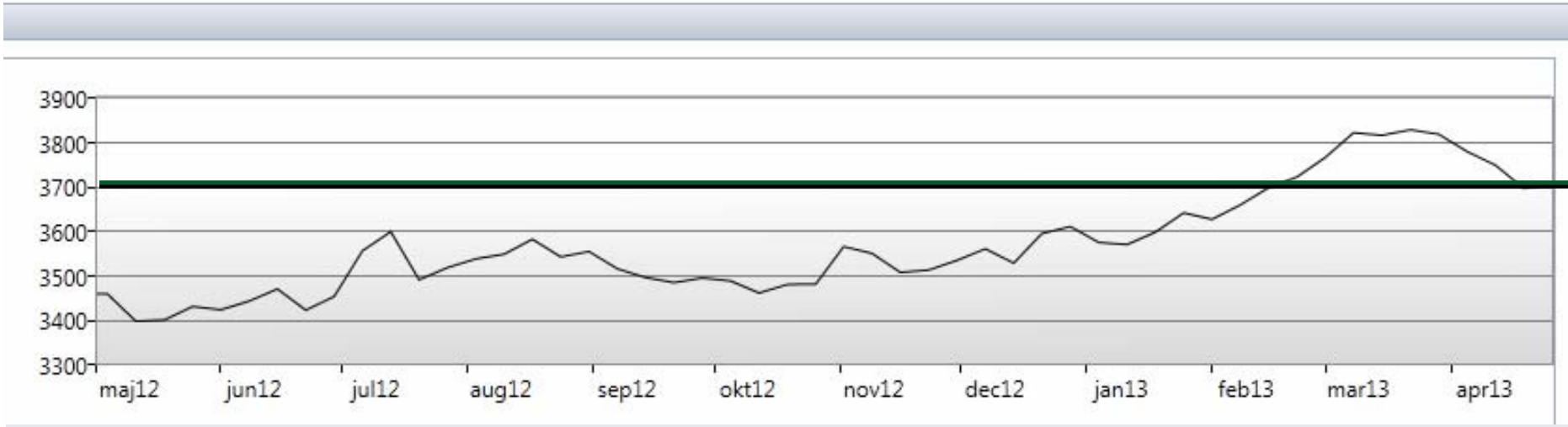
Kg milk dairy per day

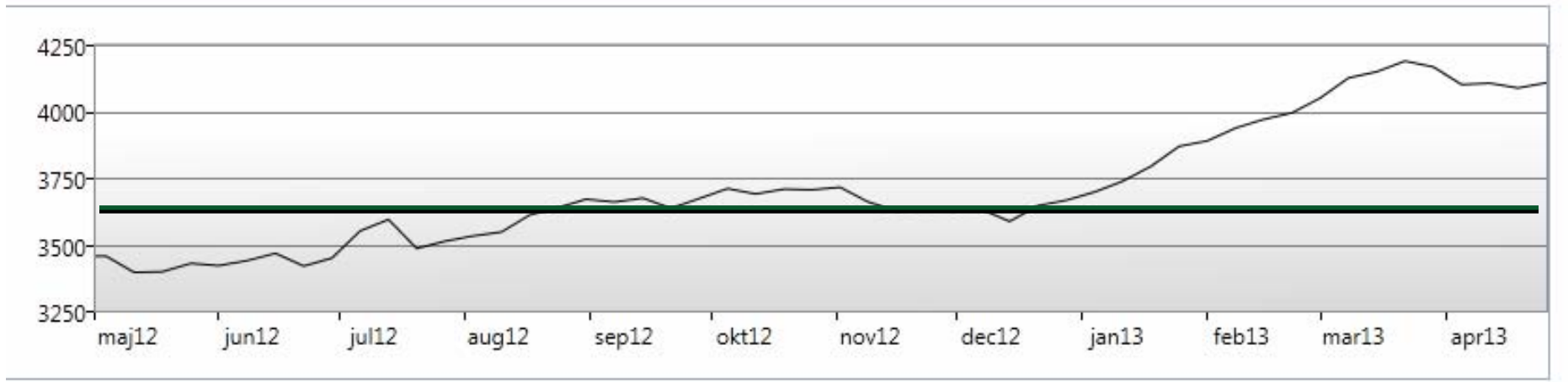


Month result

Parameter	Unit	Maj12	Jun12	Jul12	Aug12	Sep12	Okt12	Nov12	Dec12	Jan13	Feb13	Mar13	Apr13
ECM prod. per cow	Kg/day	27	27	27,6	27,7	27,5	28,2	28	27,9	29,1	30,5	31,2	31,1
Milk deliv. to dairy	Kg/day	3417	3446	3536	3608	3663	3708	3639	3635	3809	3978	4154	4103
Milk deliv. to dairy	Ton/mth	106	103	110	112	110	115	109	113	118	111	129	123
Fat pct., dairy	Pct.	4,18	4,12	4,12	4,1	4,12	4,21	4,28	4,23	4,25	4,31	4,17	4,2
Protein pct. dairy	Pct.	3,24	3,2	3,2	3,26	3,36	3,43	3,5	3,51	3,46	3,43	3,32	3,4
Total no. at the end	Head	138	137	137	143	145	146	145	145	147	145	144	145
No. of lact. end	Head	121	125	123	130	134	136	129	126	132	133	132	135
Total calvings	Head	9	14	16	16	13	14	12	9	16	15	9	14
1. calving calv.	Head	2	4	5	6	5	4	5	3	7	6	3	6
Purchase	Head												
Slaughter	Head	1	4	4		2	3	5	2	5	7	3	5
Sale of cows for live use	Head												
Dead	Head		1	1		1		1	1		1	1	

Consequences of changes





Questions where Prognosis can help with the answer

- What is the production next year?
- What is the utilization of the quota?
- How many animals do I need to buy extra to increase the production 20 % within ½ year?
- How many heifers can I expect to sell without decrease of production?
- And lots of other questions..

Why is Prognosis popular?

Used by approx. 75 % of dairy farms in Denmark (85 % of the cows?)

- The prediction is trusted
- By farmers
- By advisors
- By financial supporters
- Because they as users have good experiences

Other areas

- Calculation of compensation
- Prediction of deliverance to dairy (is being tested)

Thanks for your attention

Welcome to

ICAR Technical Workshop

29 – 31 May 2013

in Aarhus, Denmark

For details check

www.icar2013.dk

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