



NorFor - status and feed optimization

NØK 2010

Harald Volden^{1,2}

¹TINE SA

²Norwegian University of Life Sciences

1. User activity and scientific status
2. Integrated feed evaluation and feeding strategies
3. Ration optimization.
Examples of using NorFor





User status

- Denmark: low
- Iceland: moderate
- Norway: moderate
- Sweden: moderate/increasing

Why moderate activity?

- A new system. A new method of ration formulation
 - Advisors skilled in the art? A complex system
 - Scientifically rooted
 - Not integrated to adjacent computer programs
 - Competition from other systems
-

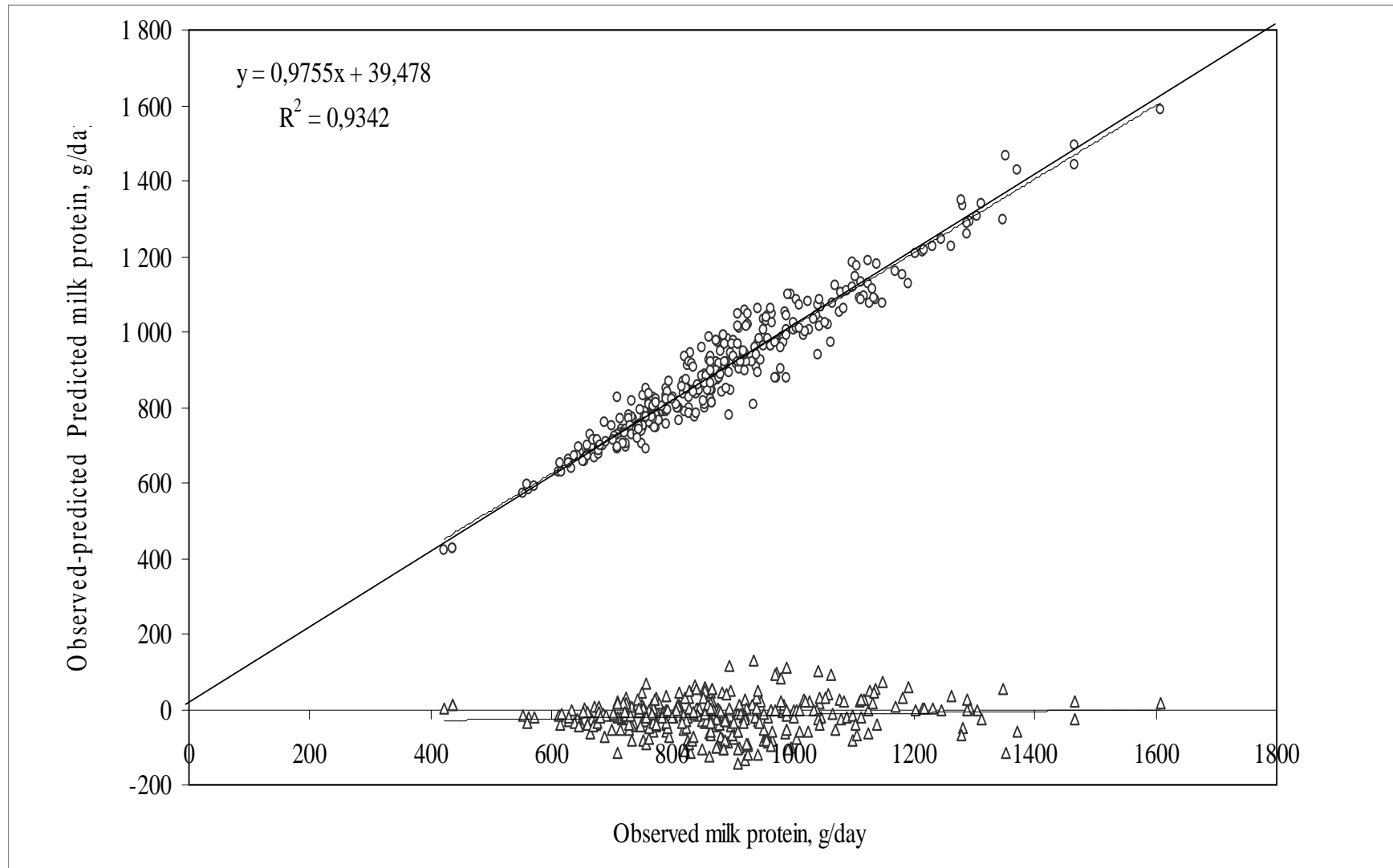


Scientific status

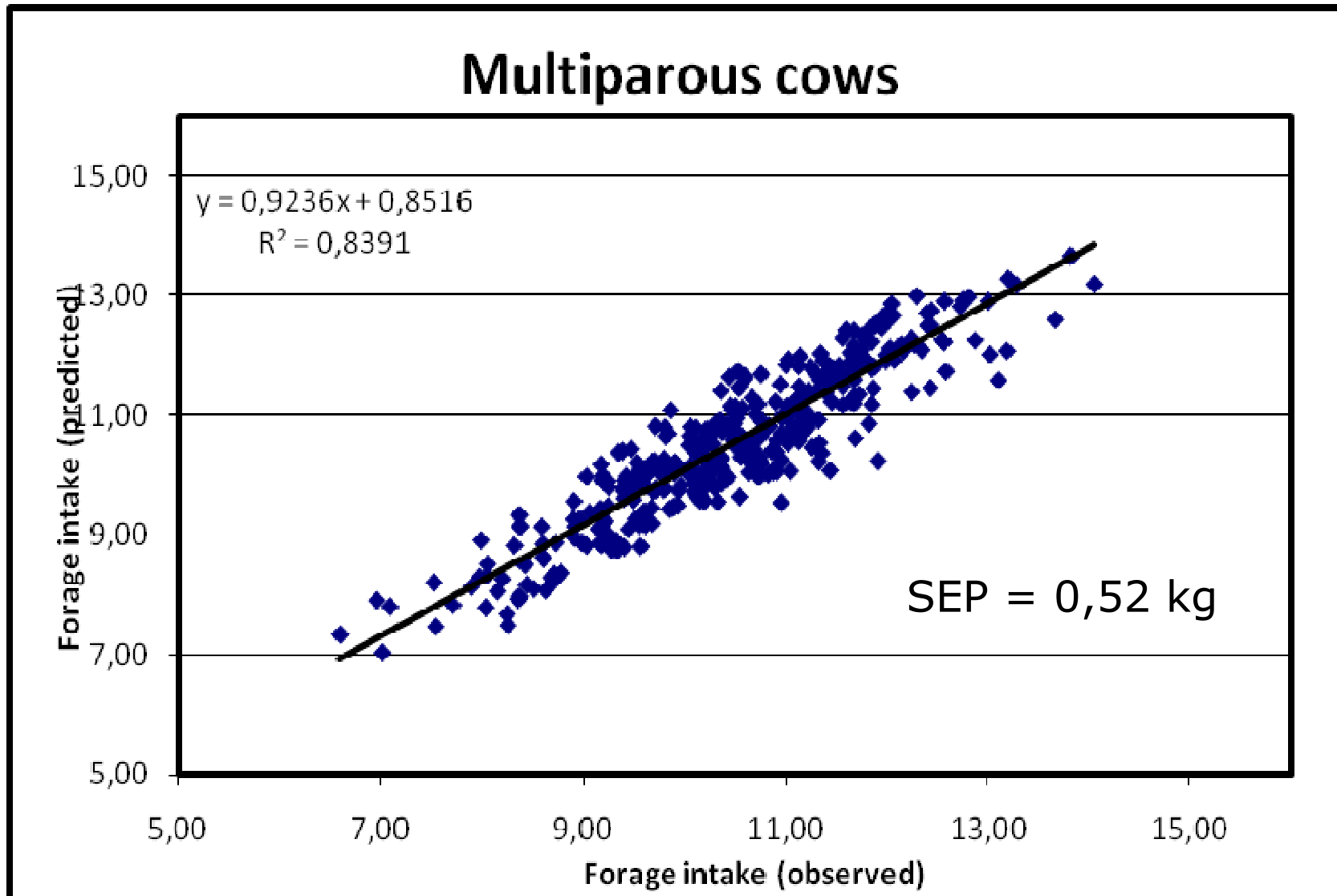
- The system will be scientifically published in 2010
 - A detailed description of the system
 - Model Equations and computer optimization procedure
 - The NorFor system is the only world wide feed evaluation system with a true non-linear feed optimizer
- An evaluation of the system



Model evaluation. Milk protein production. Nordic experiments. 429 diets

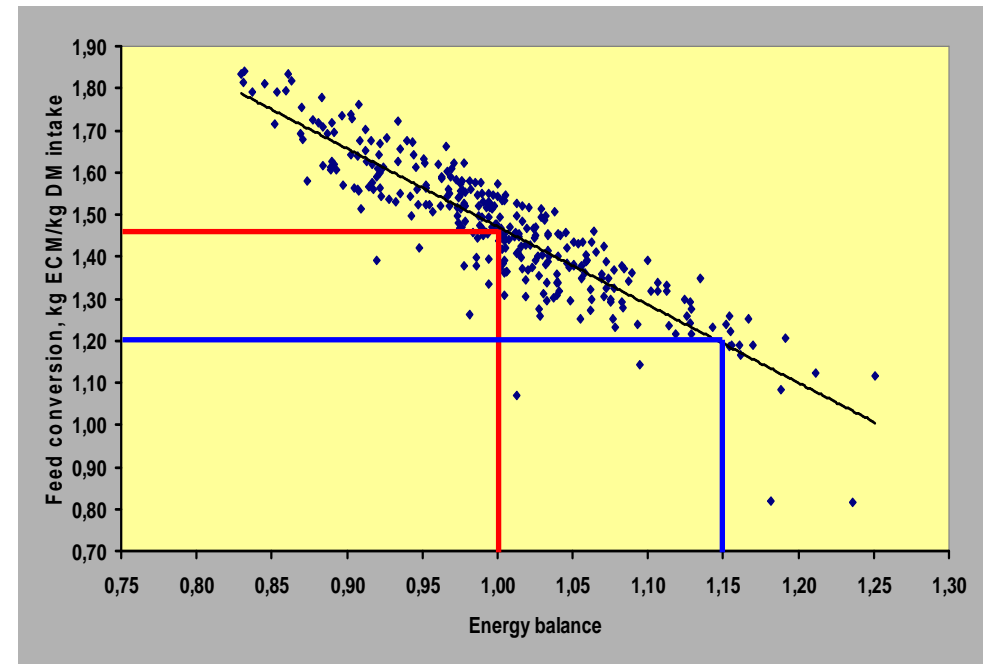


Model evaluation. Forage intake. Icelandic experiments. Individual cows



Feed evaluation and feeding strategies

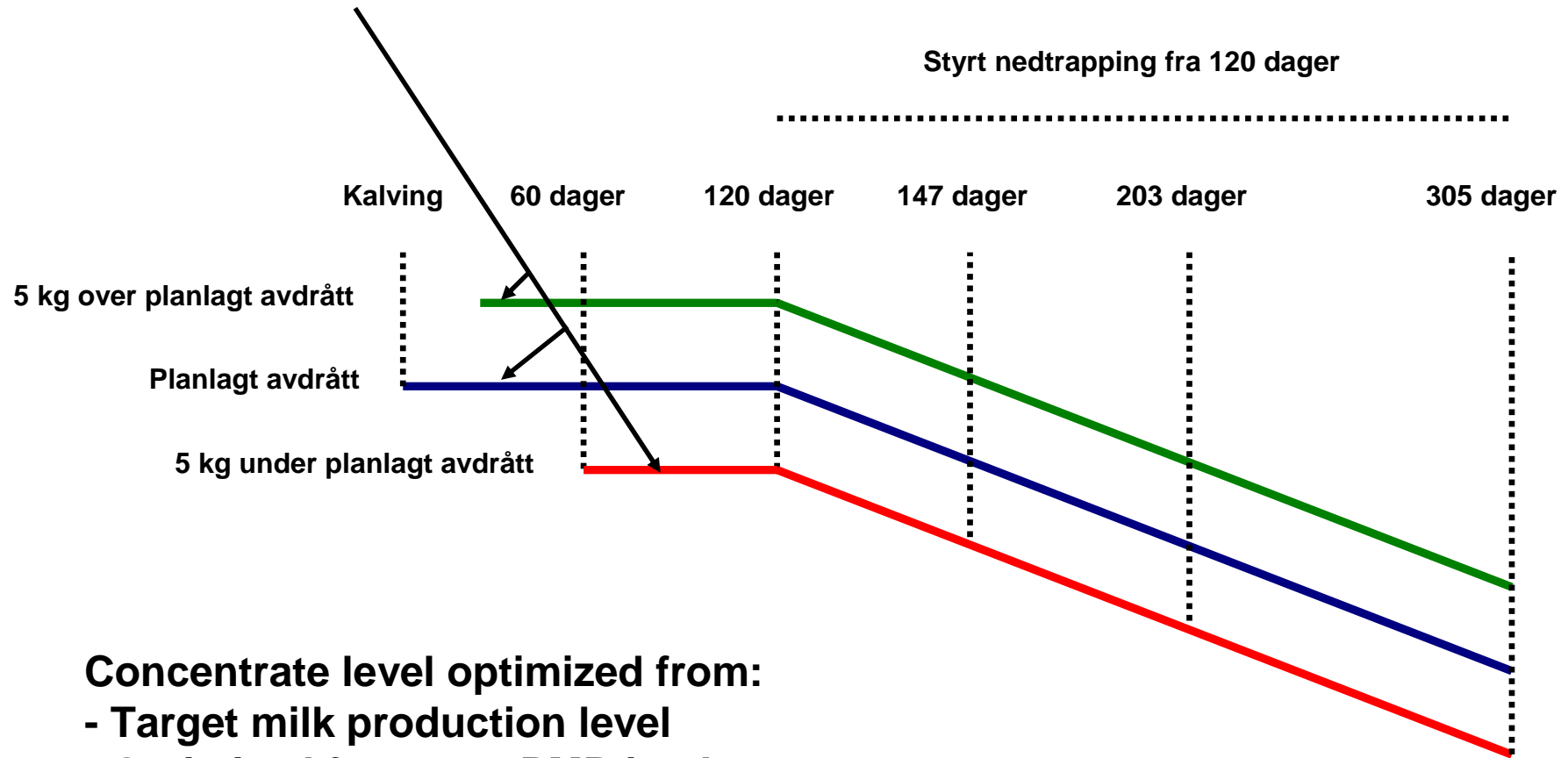
- Ration formulation and optimization
- Alternative feeding strategies
 - Individual cows
 - Standard lactation curve
 - Partial mixed ration (PMR)
 - Total mixed ration (TMR)
- Goal: high feed efficiency





Feeding according to standard lactation curve

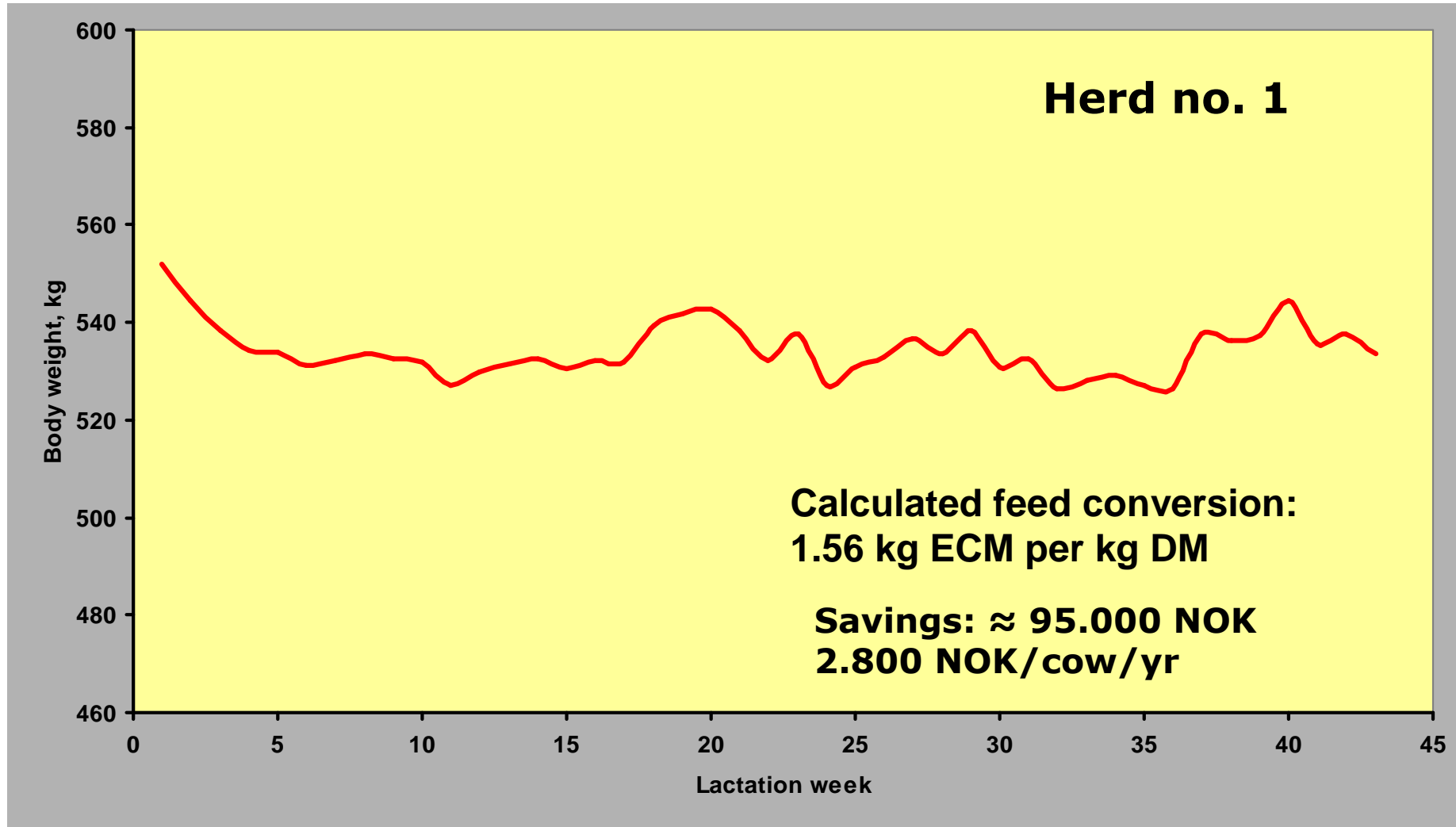
Concentrate levels



- Concentrate level optimized from:
- Target milk production level
 - Optimized forage or PMR intake

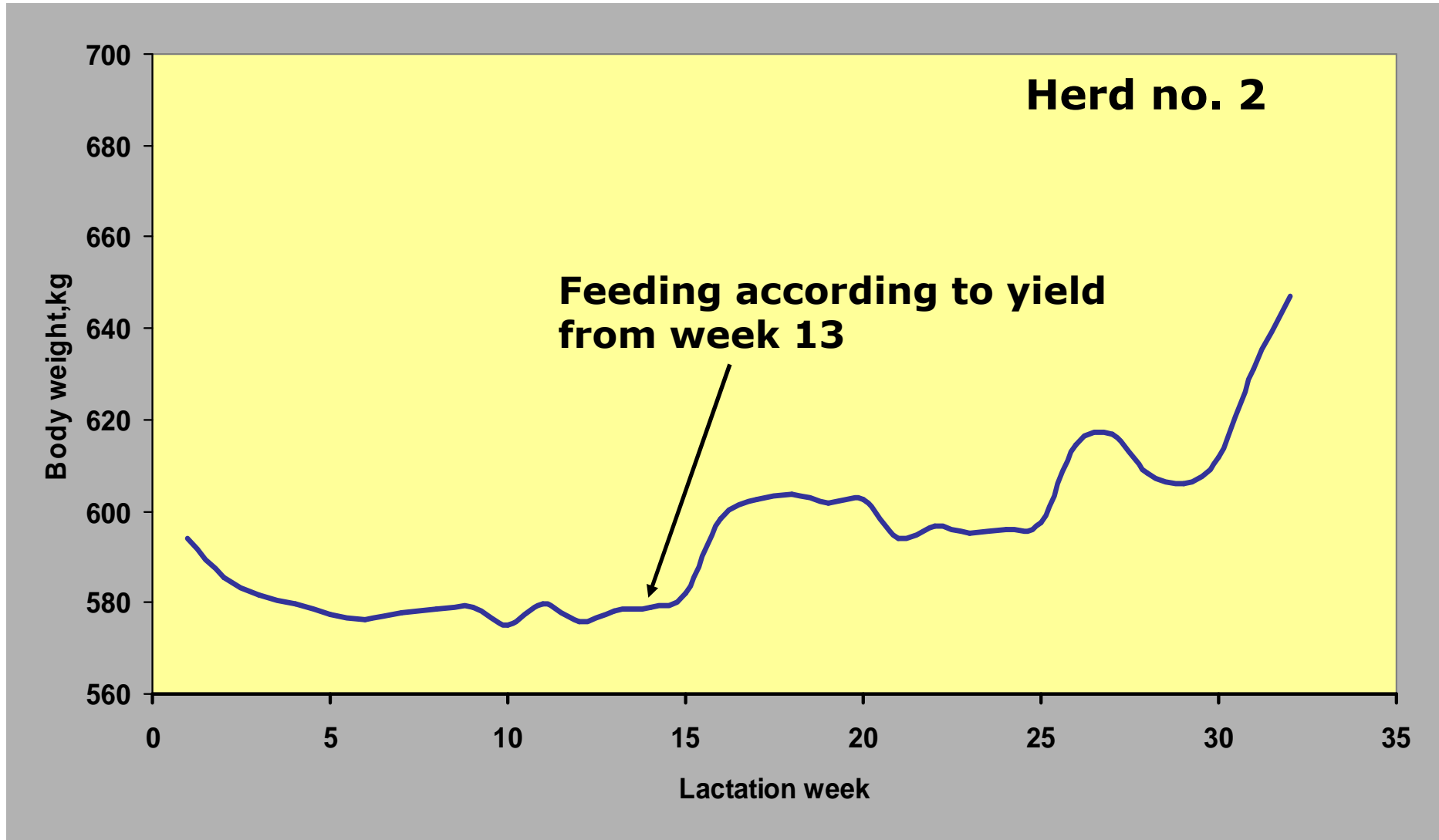


Feeding according to standard lactation curve. Body weight change

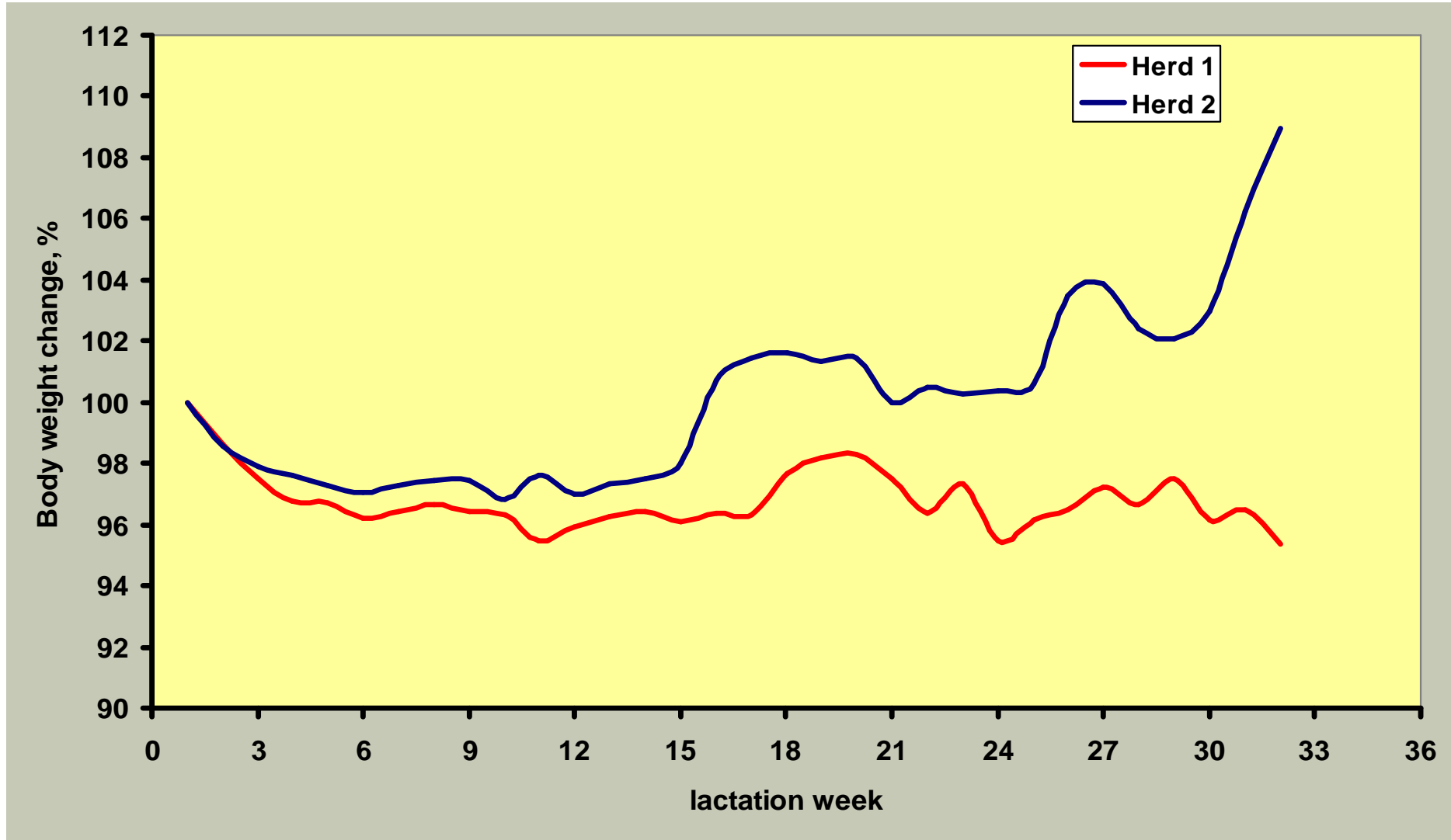




Feeding according to standard lactation curve week 1-13. Body weight change

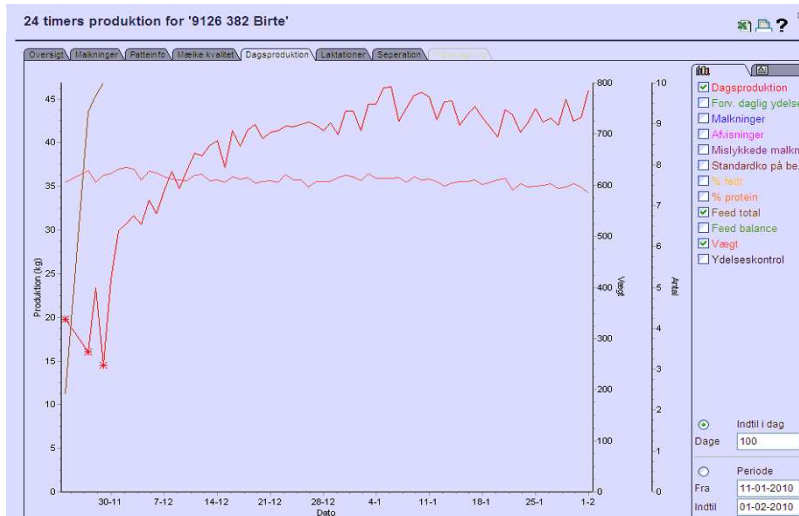


Feeding strategy and body weight change





The feeding strategy is programmed in the herd management system





NorFor ration optimization. Example from a Norwegian herd

Optimization variables

Possible variables: 84

Ration cost: 1

Feed intake: 7

Energy: 5

Protein and amino acids: 13

Nutrients: 6

Rumen metabolism: 13

Total tract digestibility: 5

Chewing time : 1

Minerals: 23

Vitamins: 7

Nitrogen excretion: 4

NorFor standard

1. Ration cost
2. Fill value (feed intake)
3. Energy balance
4. Energy intake
5. AAT balance
6. AAT/NEI
7. PBV
8. Fatty acids
9. Rumen impact factor
(NDF degradation)



NorFor ration optimization. Example TMR.

	Keenan	NorFor
Composition, % of DM		
Grass silage	50.0	54.4
Untreated straw	3.8	
Wheat (rolled)	23.3	24.3
Dried beet pulp	2.7	8.1
Calcium fat	0.47	0.76
Protein supplement (soybean + maize gluten meal + Rape seed)	17.7	7.9
Rapeseed, Expro		2.7
Mineral + vitamins	2.0	1.9
Chemical composition		
Crude protein, g/kg DM	181	164
Starch, g/kg DM	192	176
NDF, g/kg DM	345	352
Lysine:methionine:histidine		2.8:1:1.1
Ration cost, NOK/kg DM	1.81	1.65



NorFor ration optimization. Example TMR.

	Keenan	NorFor
Target milk yield	30	30
Expected feed intake, kg DM	21.2	19.7
Measured feed intake		19.2
Ration cost, NOK/cow/day	38.20	32.50
Savings, NOK/day. 36 cows		+205
Savings, NOK/cow/yr		2070

Production results in April and May 2010:

Average ECM: 28.6 kg/day

Fat: 4.10%

Protein: 3.53%.

Urea,mM:4.9 mM

Average days in milk:187



Experience by use of NorFor. Nina and Inge Brekke

- NorFor and TINE OptiFôr used since the start in 2007
- The experience is very good.
 - utilise the system to formulate and control rations
 - Evaluate forage quality and production response
 - Used in combination with an economical evaluation program (EK)
 - Set target milk yield and seasonal feed planning
 - Use the system to understand changes in feeding responses
- Feeding strategy:
 - According to standard lactation curve after 90 days
- TINE OptiFôr (The Norwegian computer tool)
 - User friendly and easy to learn, although it is a complex system



Experience by use of NorFor. Torill Midtkandal and Johan Øvreeide Godø

- NorFor and TINE OptiFôr used since the start in 2007
 - The experience is very good.
 - utilise the system to formulate and control rations
 - Evaluate forage quality
 - Setting target forage quality
 - Using the program as a computer game
 - After introduction of the system:
 - a very rapid change in production
 - Higher milk yield
 - Higher milk fat content
 - An important planning tool when heading for higher milk yield
 - TINE OptiFôr
 - User friendly and easy to learn
-



Conclusions

- **The use of Norfor is moderate**
- **The test results are very good**
- **The system must be combined with efficient feeding strategies**
- **The system focus on feed costs and optimum ration formulation**