



Luxembourg FILL Pasture project 2003- 2009

with focus on Pasture ruler:

Tool to estimate and evaluate pasture intake
with high merit dairy cows



FILL- Pasture Project:

promote pasture management with high merit dairy cows

FILL: “Fördergemeinschaft Integrierte Landbewirtschaftung Luxemburg”


Association promoting sustainable agriculture Luxembourg; member of the
European Initiative for Sustainable Development in Agriculture (EISA)

Project aims: 2003-2005 extended 2006-2009

- 1.analyze causes (economic, pasture quality, animal factors) of insufficient grazing of dairy cows
- 2.optimize pasture quality
- 3.optimize pasture intake
- 4.identify the milk response to an increase of pasture intake.

Partners:

1. ***ASTA*** (Administration des services techniques de l'Agriculture): *J. Bormann*
2. ***SER*** (Service d'économie rural): *G. Conter*
3. ***Lycée Technique Agricole Ettelbrück:*** *M. Hoffmann; C. Felten; M. Santer; H. Kohnen*
4. ***Convis*** (Herdbook): *D. Kloecker*
5. ***UNI Bonn:*** *J. Schellberg*



FILL- Pasture Project ended 2009 and led to

“OPTIGRAS” (*advisory service optimizing grass utilization; dairy board*)

Since 2009 the LTA – section is a partner in

DAIRYMAN

INTERREG IVB North-West Europe

Sustainable dairy production

7 countries with ***14 regions*** involved > ***120 pilot farms***

F : Brittany & Pays Loire & Nord Pas Calais;

B: Wallonia & Flanders;

D: Baden Württemberg;

GB: Northern Ireland

L; NL; I

50% of the agricultural surface is grassland

50% of the agricultural surface is grassland

Grazing in Luxembourg is decreasing

Actual situation:

	Grazed Grass (DMI)
85%	cows have free outdoor access
65%	>2 kg DM grazed grass/cow/day grazing season
50%	>5 kg DM grazed grass/cow/day grazing season
10%	>10 kg DM grazed grass/cow/day grazing season



Reasons for decreasing

- a) growing herd size → limited access to available pasture
- b) misunderstood nutrition guidelines
 - “balanced ration” dogma: high merit cows will starve by grazing
- c) Missing of knowledge on grazing
 - 1960, 100% of Luxembourgish dairy farmers practiced intensive grazing. This knowledge disappeared more or less completely
- d) Missing knowledge about the 2 dairy systems:
 - a) **“intensive Milk production system” (accepted and promoted):**
 - maximum input with high output
 - (high milk daily milk/cow/year is needed to make profit from the high invest/cow)
 - b) **“Low cost milk production system with grazing” (disregarded):** make profit of the low cost of grazed grass, but the whole system has to be “low cost”
- e) Grazing has no (economic) lobby (Grazing does not sell)
 - harvesting, feeding and slurry machinery
 - purchased fodder concentrates and supplements
 - expensive “animal welfare” housing
 - breeding semen (artificial insemination bulls selection schemes do not fit to grazing)
- f) NO financial subventions on grazing (subvention for everything else)

FILL Pasture Project

- On Farm Experiment:
 - 4 typical dairy farms
- high merit Holsteins cows
- all year calving
- Average herd size: 35- 55 cows
- average milk yield: 8000-9000 kg milk cow⁻¹ year⁻¹.
- Pasture + supplementation:
 - silage (Grass and/or maize)
 - feed concentrate (mostly purchased)
- stocking rate: 1.5 - 3.5 cows ha⁻¹ year⁻¹
- temperate (maritime) European climate
 - average mean precipitation: 800 - 1000mm year⁻¹

Materials and Methods

Data collected during grazing season:

- daily milk produced (kg herd⁻¹)
- daily supplementation (kg herd⁻¹)
- daily milked cows (number)
- daily paddock allocated

Pasture intake (pDMI):

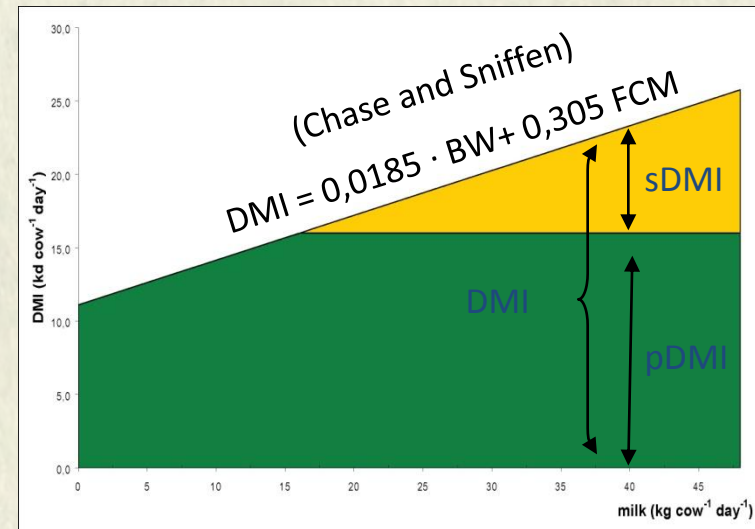
Calculated

Pasture = Total Intake - supplementation

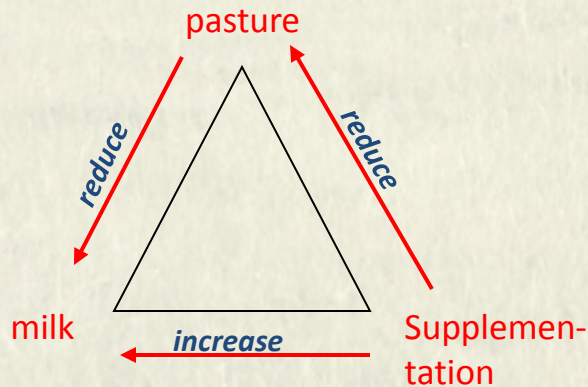
$$pDMI = DMI - sDMI$$

$DMI = 0,0185 \cdot BW + 0,305 \text{ FCM}$ (Chase and Sniffen)

sDMI = DMI for supplementation



Evaluate performance



Intensive dairy production

High merit dairy cows

High nutritional requirements: Supplementation

→ High daily milk

→ Expensive supplementation

→ Confinement



Intensive pasture

reduced supplementation to optimize pasture intake

→ lower daily milk

→ low-cost home grown forage

→ pasture



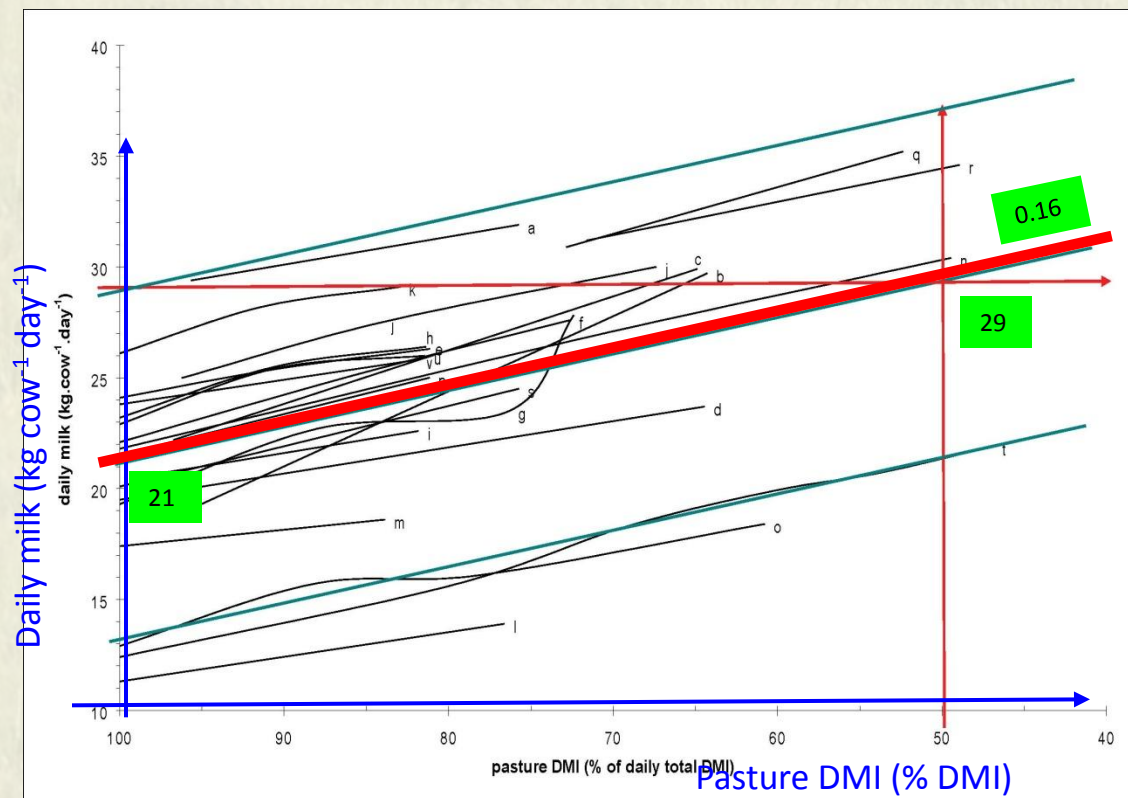
„Daily milk“ is a bad criterion to evaluate pasture performance
→ increases supplementation
→ decreases grazing

Evaluate performance:

Review of published experiments

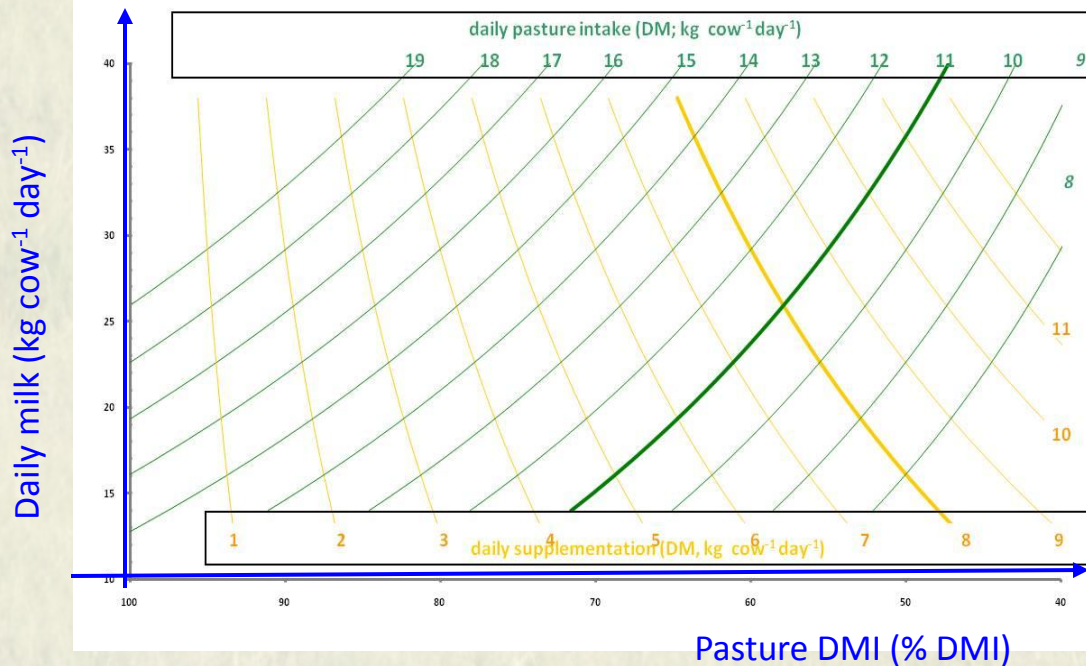
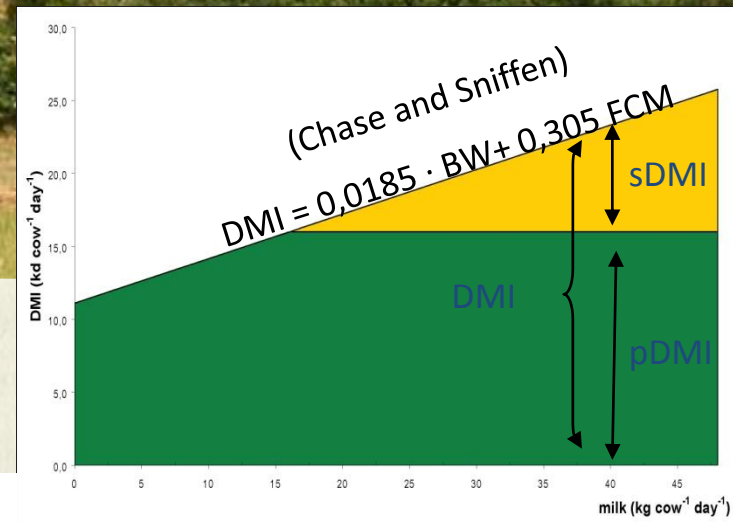
Criteria for selection (measured daily milk, measured pasture intake and measured supplementation) from a pool of 147 experiments

2 criteria: Daily milk + pasture intake (% DMI)



Arriaga-Jordan and Holmes, 1986
Bargo et al., 2002
Berzaghi 1996
Delaby 1997
Delaby 2001
Gibb 2002
Dillon 1997
Hoden 1991
Kennedy, Dillon 2003
Mathieu 2001
O'Brien 1996
O'Brien 1999
Reis and Combs, 2000
Robaina et al., 1998
Rook 1994
Sayers, 1999
Wales 2001
Walker et al., 2001
Wilkins 1994
Wilkins 1995

Pasture ruler



$$\text{Pasture DMI (\% DMI)} = \frac{pDMI}{DMI}$$

$$sDMI \text{ (kg cow}^{-1} \text{ day}^{-1}\text{)}$$

$$y = \frac{100 * pDMI}{0.305x} - \frac{0.0185 * BW}{0.305}$$

$$pDMI \text{ (kg cow}^{-1} \text{ day}^{-1}\text{)}$$

$$y = \frac{sDMI * 100}{(100 - x) * 0.305} - \frac{0.0185 * BW}{0.305}$$

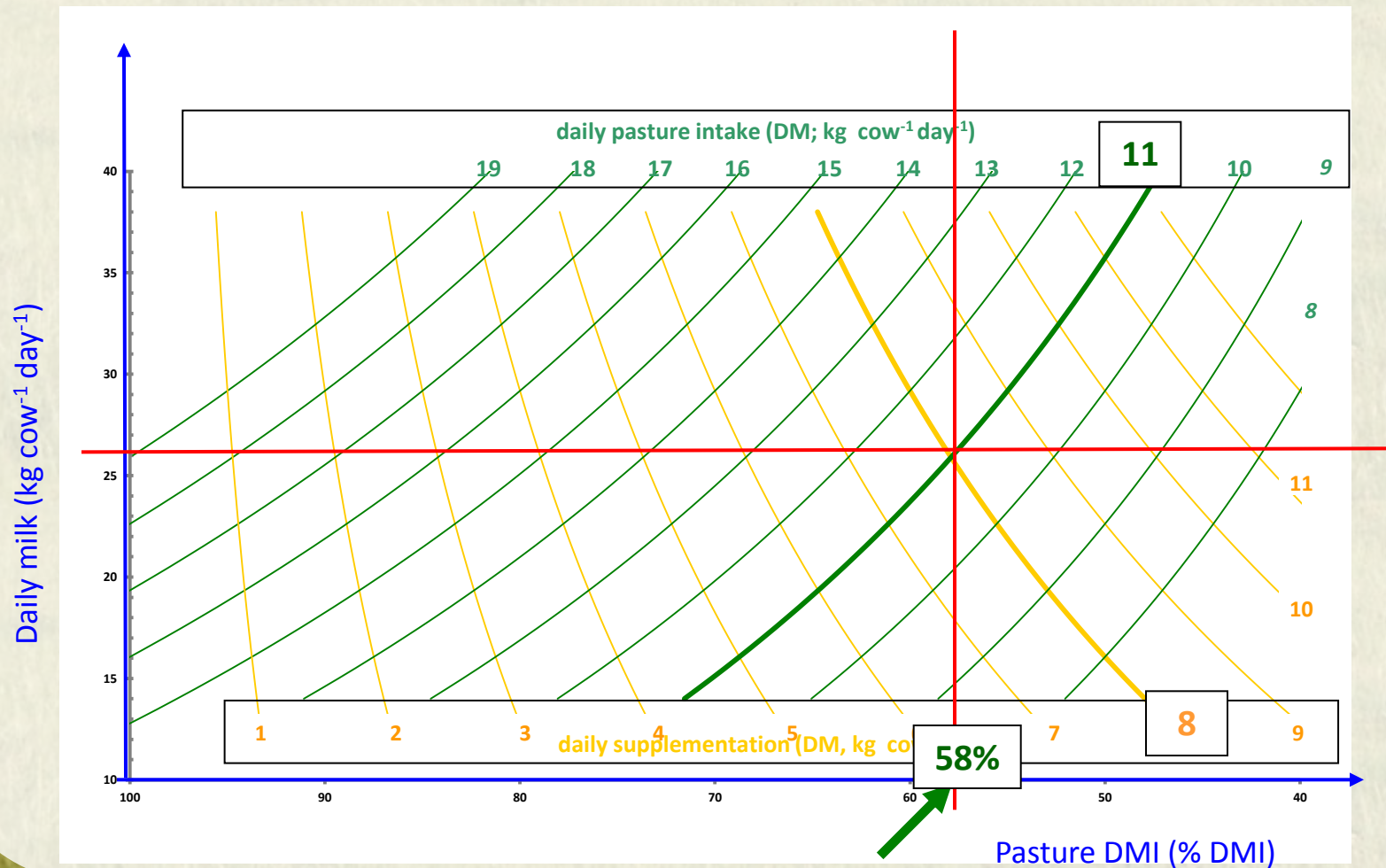
Pasture ruler: predict pasture intake



Example:

Average daily milk: 26 kg cow⁻¹ day⁻¹

Average daily supplementation: 8 kg cow⁻¹ day⁻¹

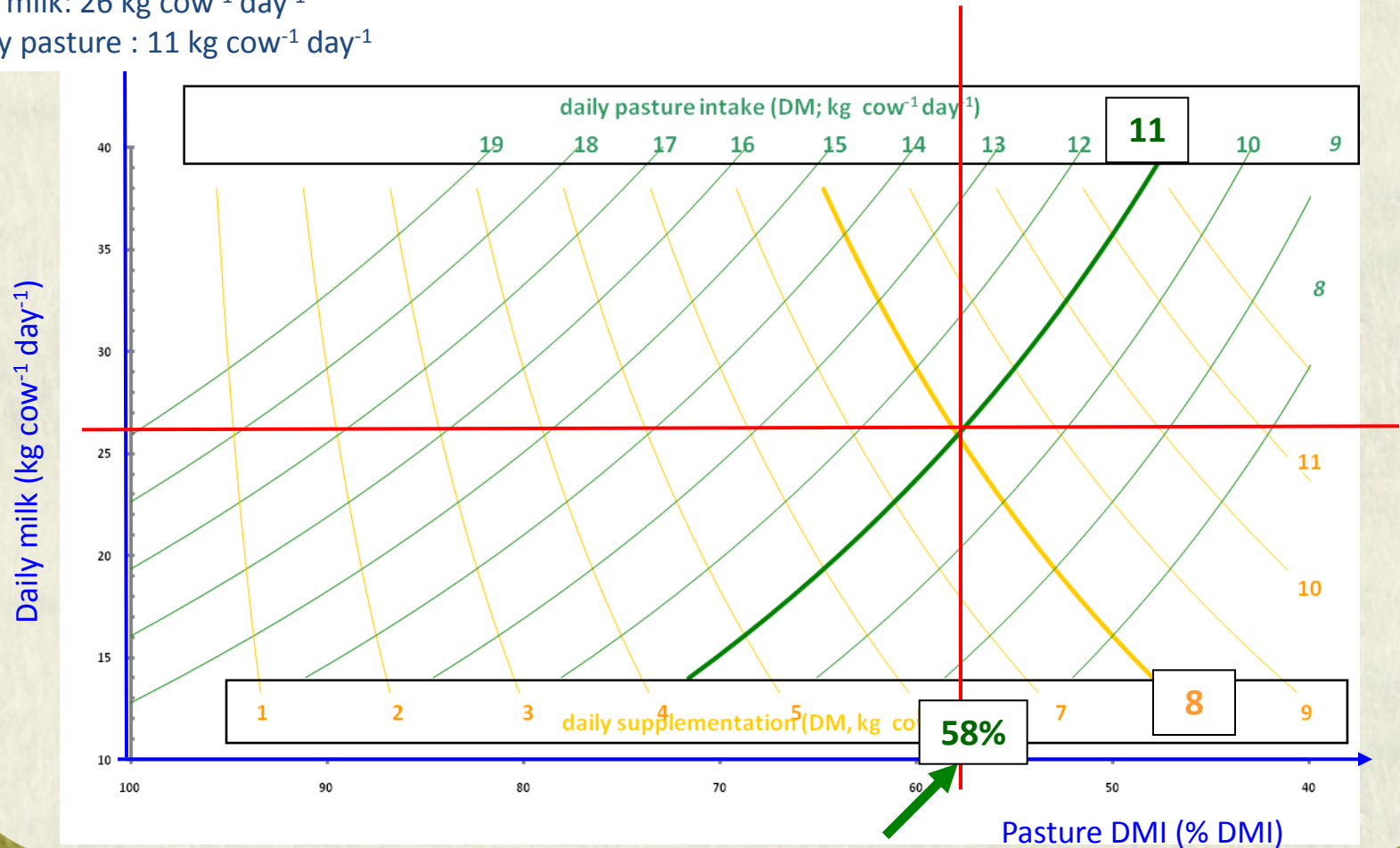


Pasture ruler: Adapt supplementation to available pasture (weekly FARMWALK with *RISING PLATE METER* and *FEED WEDGE*)

Example:

Average daily milk: 26 kg cow⁻¹ day⁻¹

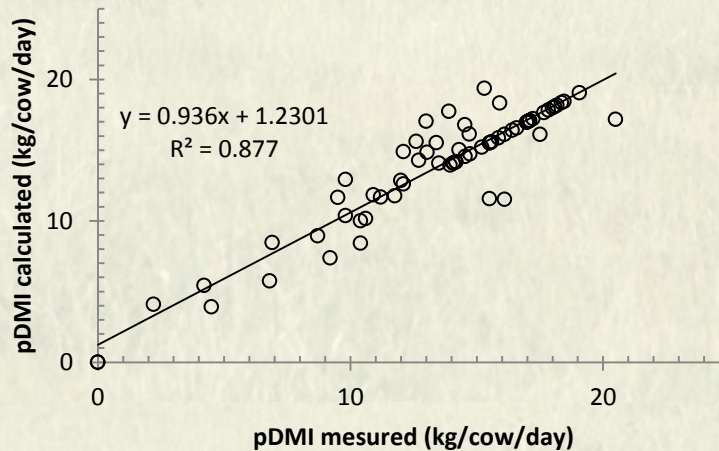
Available daily pasture : 11 kg cow⁻¹ day⁻¹



Validation

Validation based on the pool of experiments selected
(measured daily milk, pasture intake and supplementation)

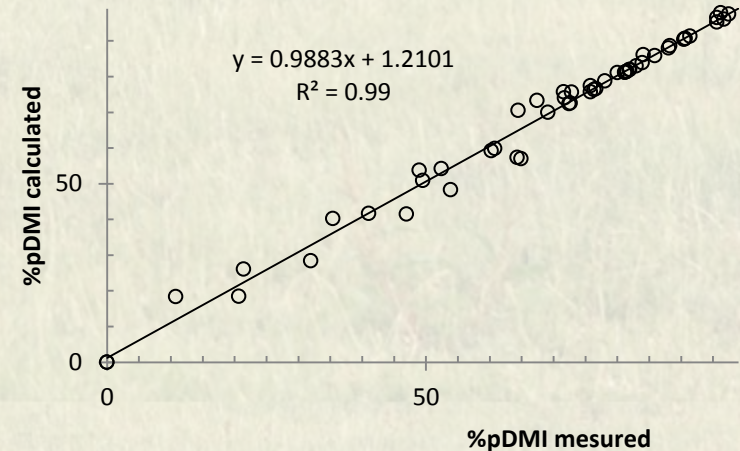
Validation for pDMI



Standard deviation 1,57 kg/cow/day pDMI

pDMI prediction is good

Validation for % pDMI



Standard deviation 2,56

%pDMI prediction is very good

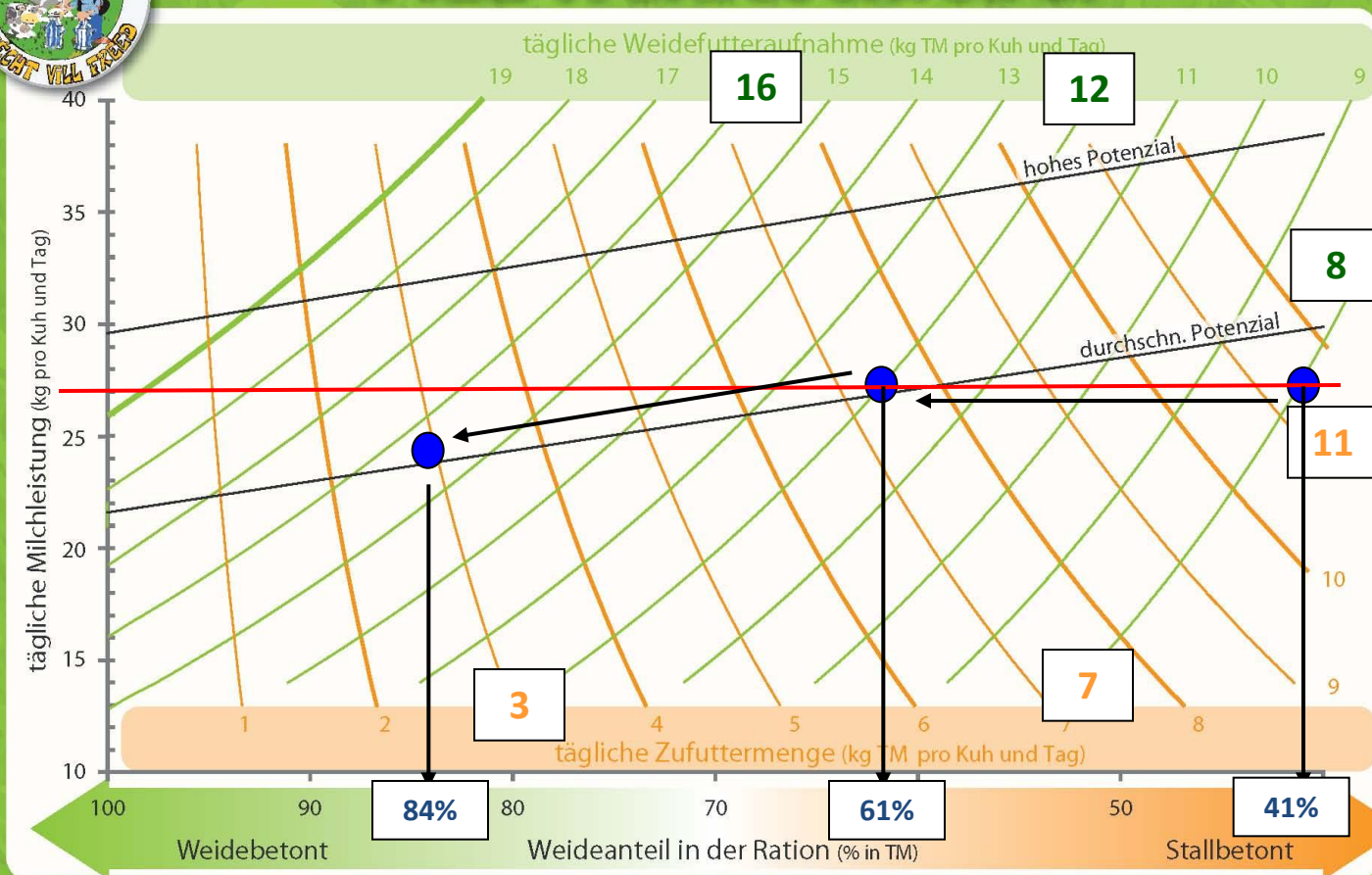
→ Position of the farm in the chart is very precise

Pasture ruler

1. Evaluate pasture intake
2. Predict milk response to a change of the supplementation amount



FILL Weideschieber



© Fördergemeinschaft Integrierter Landbau Luxemburg - Weideprojekt
www.weed.lu

“On Farm” Results: Pasture intake

NOTICED daily (+/- 10 minutes/day)

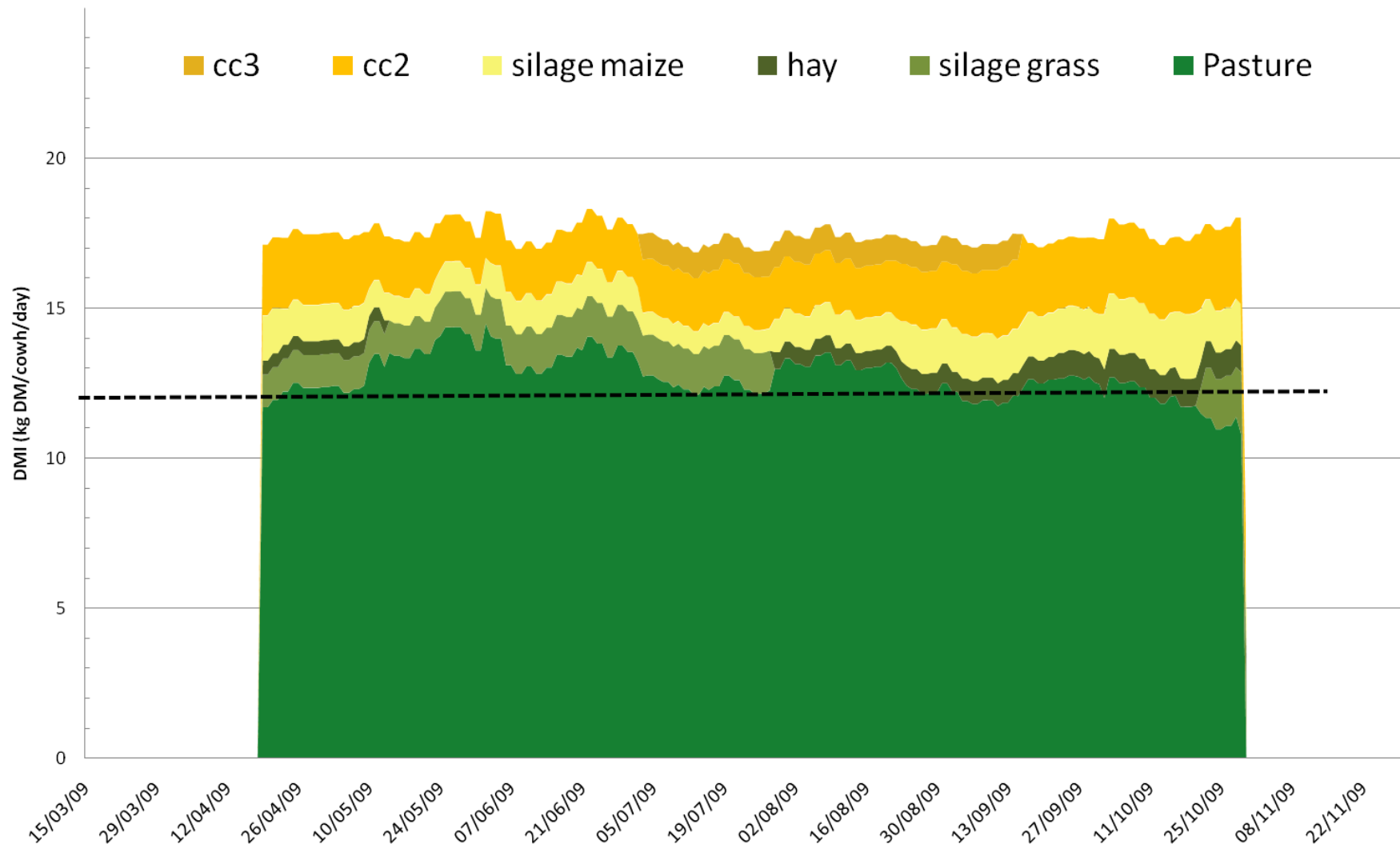
1. Daily Milk (bulk milk; kg/herd/day)
2. Number Milked cows
3. Daily supplementation (kg/herd/day)
4. Daily allocated pasture

Guidelines:

1. Start grazing early in spring (“pregrazing”)
2. Graze tight (“Short herbage grazing”)
start grazing at 7- 11 cm high
3. Reduce supplementation (reference balanced winter ration)
 - Avoid conserved grass (grazed grass is always of better quality)
 - Reduce maize silage by half
 - Limit concentrate 6 kg /cow/day

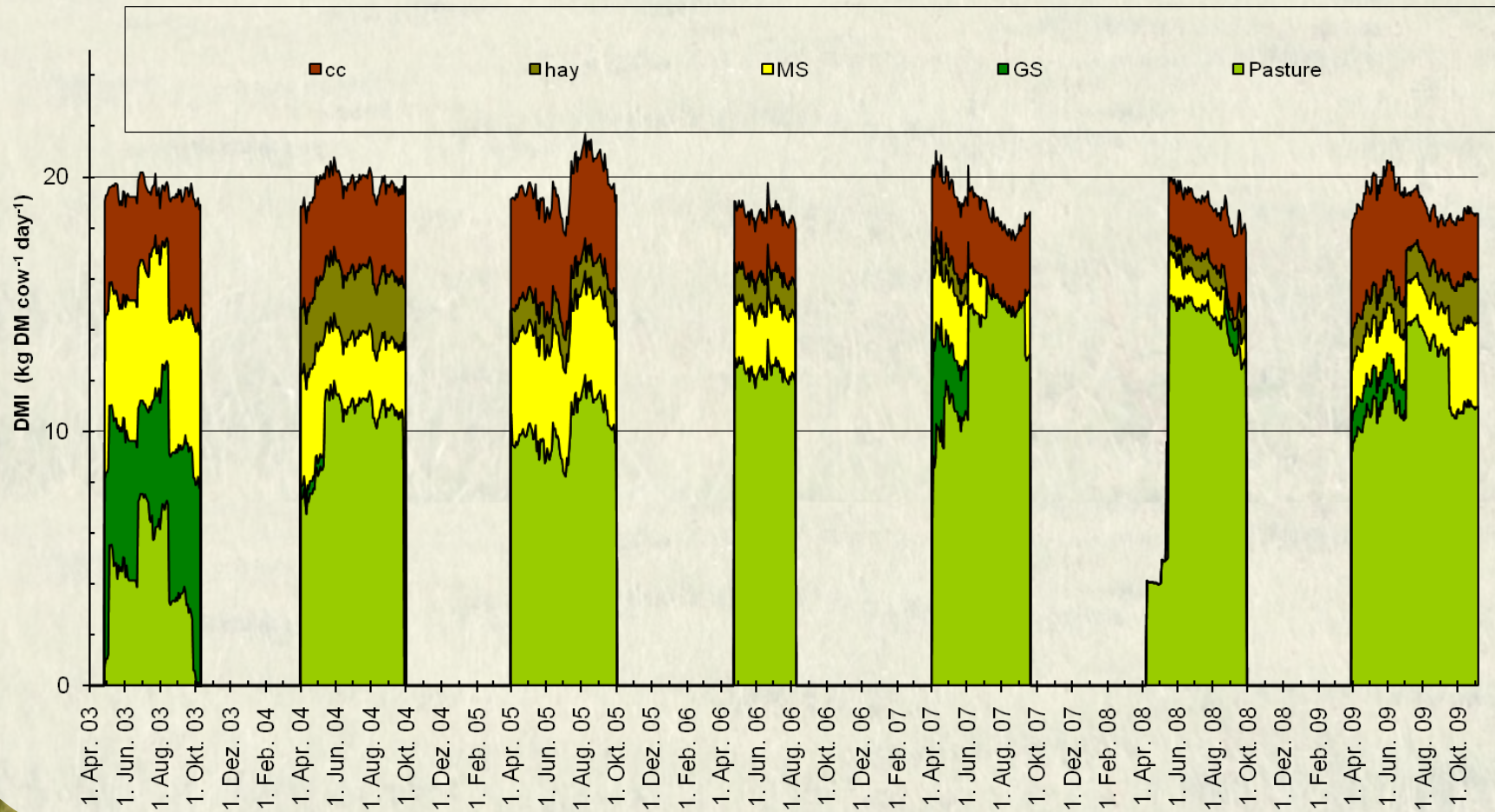
“On Farm” Results: Pasture intake

Pasture intake (2009 ; FARM A)



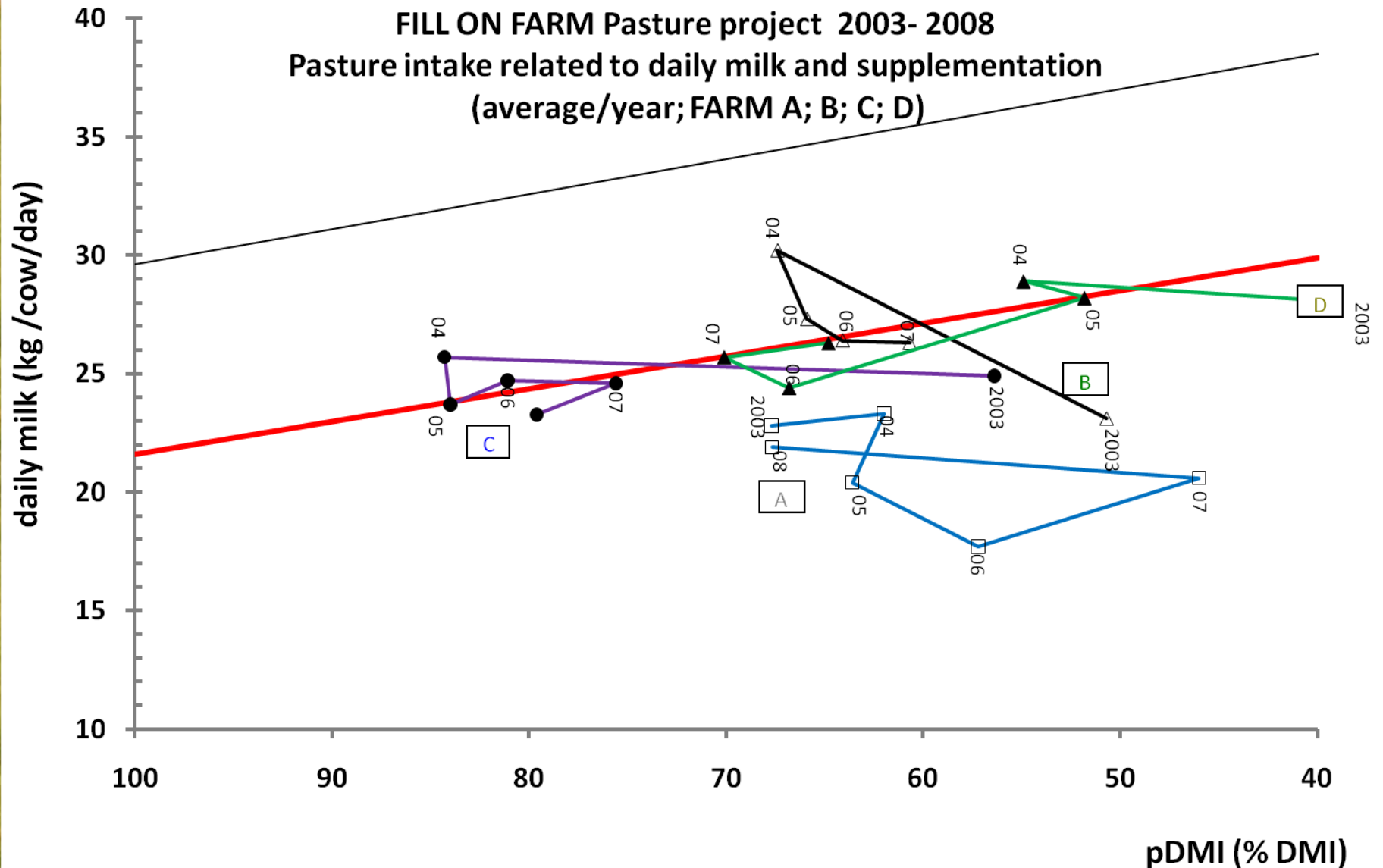
"On Farm" Results

Pasture intake Farm D (2003-2009)



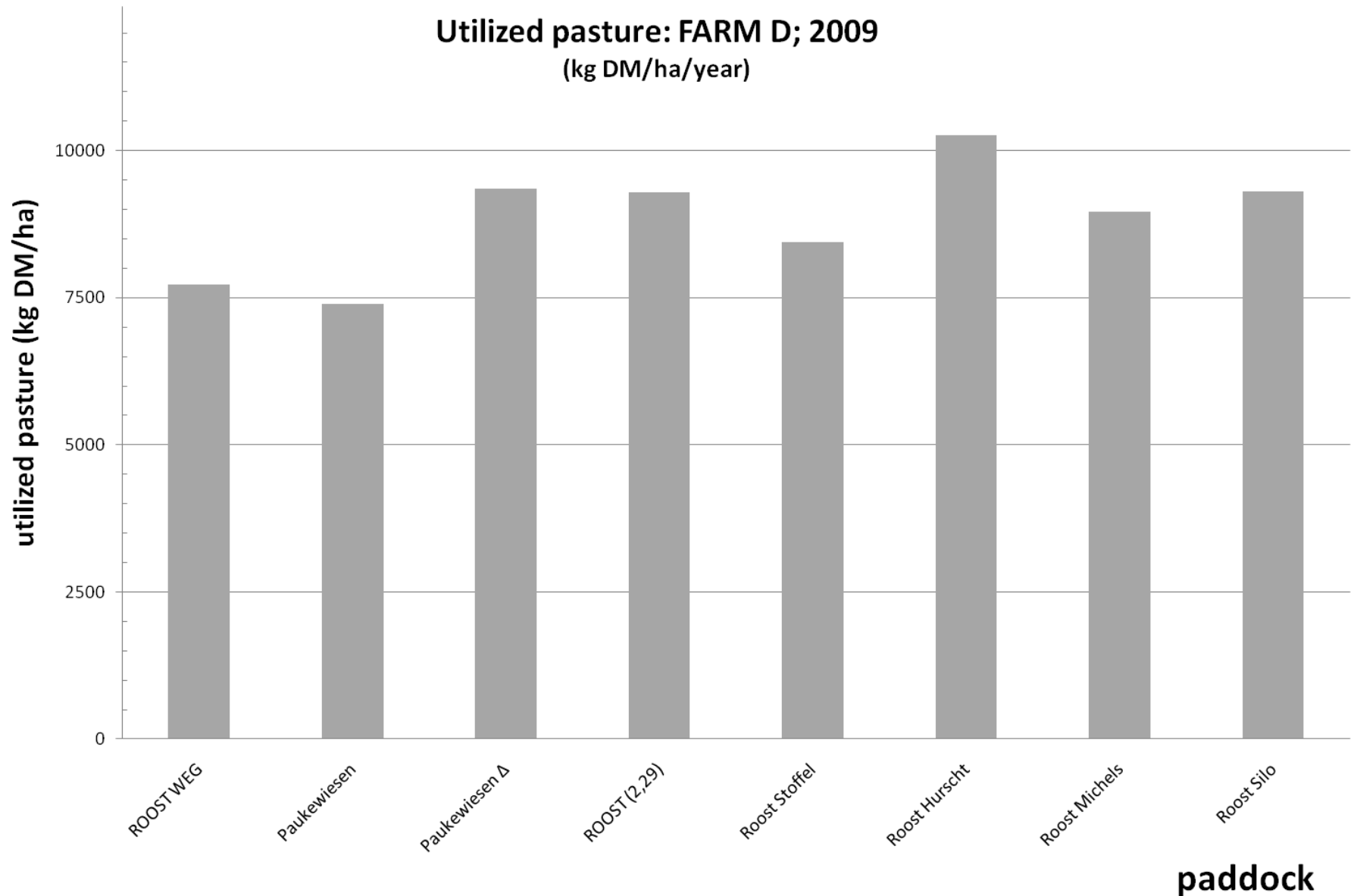
"On Farm" Results

FILL ON FARM Pasture project 2003- 2008
Pasture intake related to daily milk and supplementation
(average/year; FARM A; B; C; D)

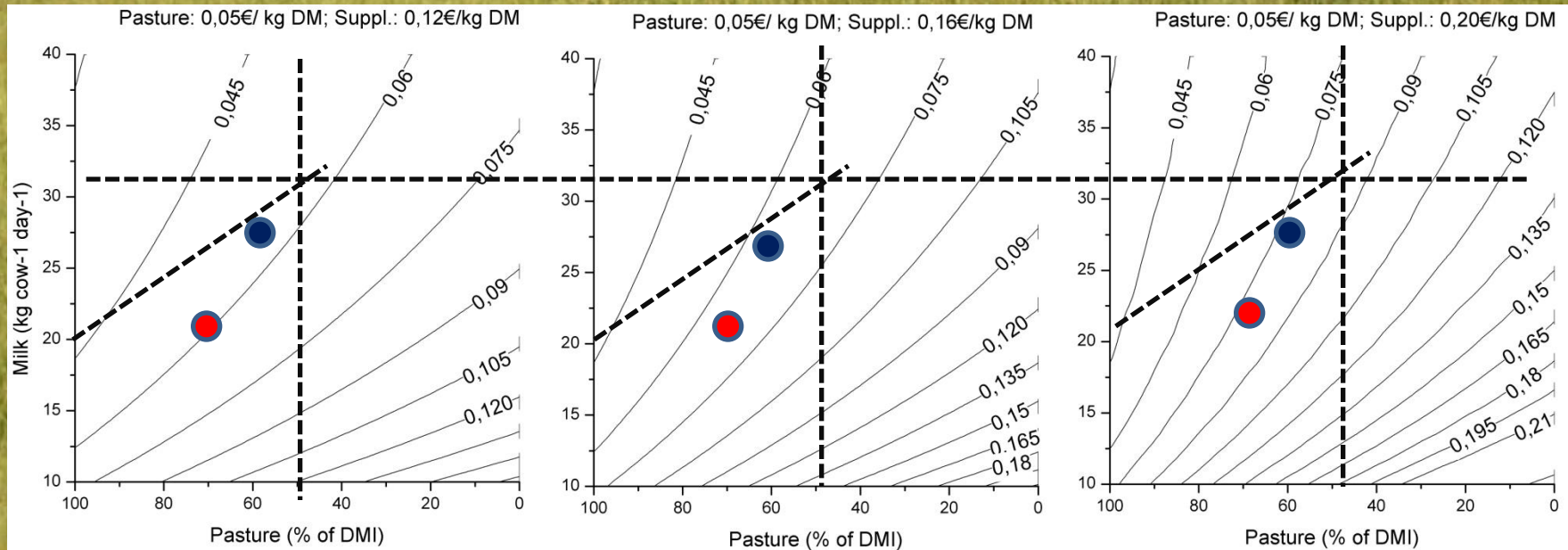


"On Farm" Results

Utilized pasture: FARM D; 2009
(kg DM/ha/year)



Pasture Ruler and Feed cost simulation





Thanks for your attention