

Forage Maize for Dairy Cattle

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Outline of Presentation



1. Quality of forage maize
2. Use in dairy diets
 1. Production responses
 2. Optimum inclusion
 3. Use as a buffer – Spring & Autumn
3. Role in spring & winter milk production

Outline of Presentation



Quality of forage maize



Forage Maize Analysis (2005-2009)

	2005	2006	2007	2008	2009*
DM	31	33	27	26	26
Starch	28	33	22	23	26
Crude protein %	8	7	10	9	9

Forage Maize Analysis (2005-2009)

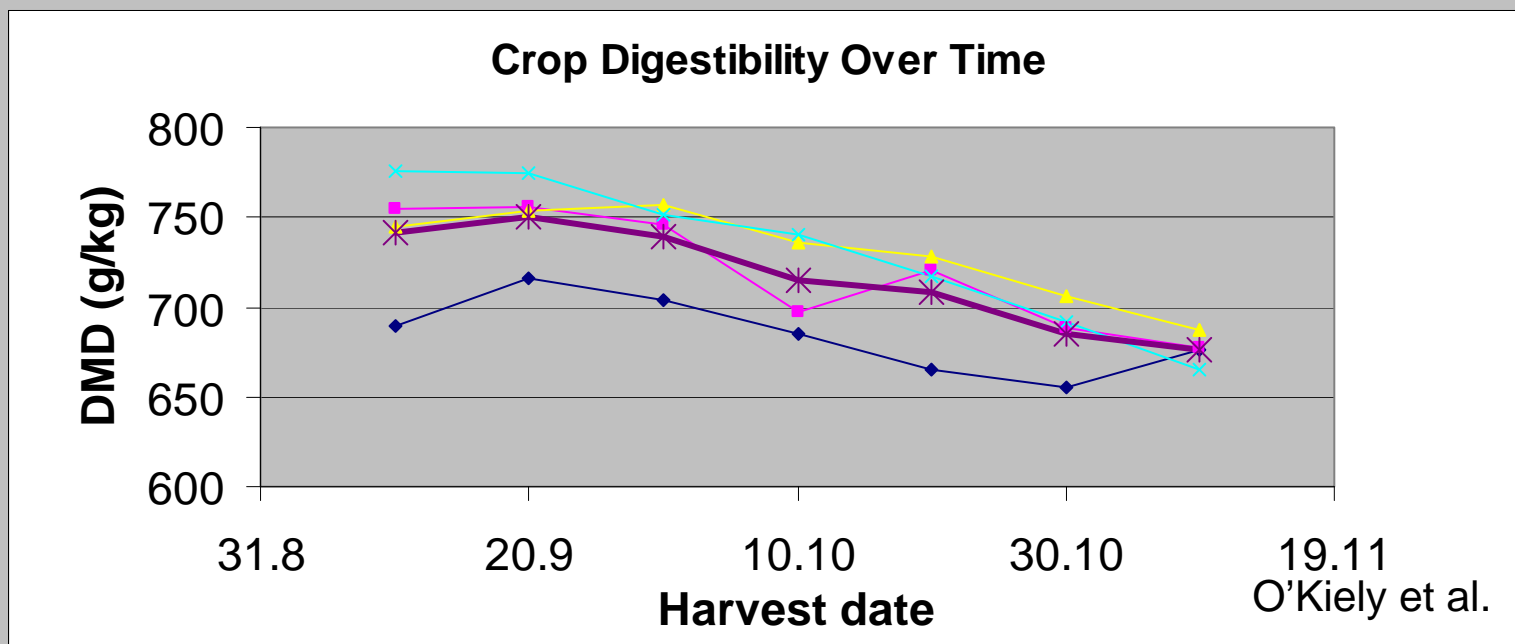
	2005	2006	2007	2008	2009*
DM	24-40	22-50	19-36	17-36	
Starch	13-38	10-40	11-31	12-30	
Crude protein %	7-8	7-9	8-12	8-12	

Impact on Feeding Value

	02-03	03-04
Starch %	14	32
Intake response kg DM	+3.2	+4.4
Milk yield response litres	+2	+2.9
Milk solids kg	+0.185	+0.271

Murphy et al. 2004

Impact on Feeding Value



- Optimum starch level = 25-30%
- At less than 20% starch = feeding value dependent on stover digestibility

Outline of Presentation



The feeding value of forage maize

Use in dairy diets

Production responses

Optimum inclusion

Buffer feeding



Production Responses

Moorepark Production Studies

<u>2003/2004</u>	GS	GS + WCW	GS+ P-WCW	GS + MS
Forage DMI kg	8.7	14.3	14.8	13.2
Milk (kg/d)	30.8	32.8	31.2	33.7
Fat + protein (kg/d)	2.046	2.189	2.256	2.317
FCE g milk solids / kg DM feed	0.132	0.104	0.097	0.116

Optimum Proportion of Forage Maize

% of Maize Silage

	<u>0</u>	<u>33</u>	<u>67</u>	<u>100</u>
Forage intake, kg	8.8	9.7	10.4	10.7
Milk yield, kg/d	21.4	23.0	23.1	22.7
Fat & Protein Yield kg	1.46	1.55	1.59	1.54

Spring & Autumn Supplementation On Grass



	Grass Only	Forage Maize	Meals
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Response (Spring–high grass) kg milk / kg supplement		0	
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Response (Spring – low grass) kg milk / kg supplement		0.75	1.00
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Response (Autumn) kg milk / kg supplement		0.44	1.27
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Outline of Presentation



The feeding value of forage maize

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Role in Spring & Winter Milk
Production

Spring Milk Production

Key principle : to maximize grass utilization, using buffers to sustain stocking rate during a deficit

Feed Budget (6,000l)

Cow requirement

5.3 tonne DM grass + silage
0.3 t DM concentrates

Grass DM Production

14.5 t DM / ha

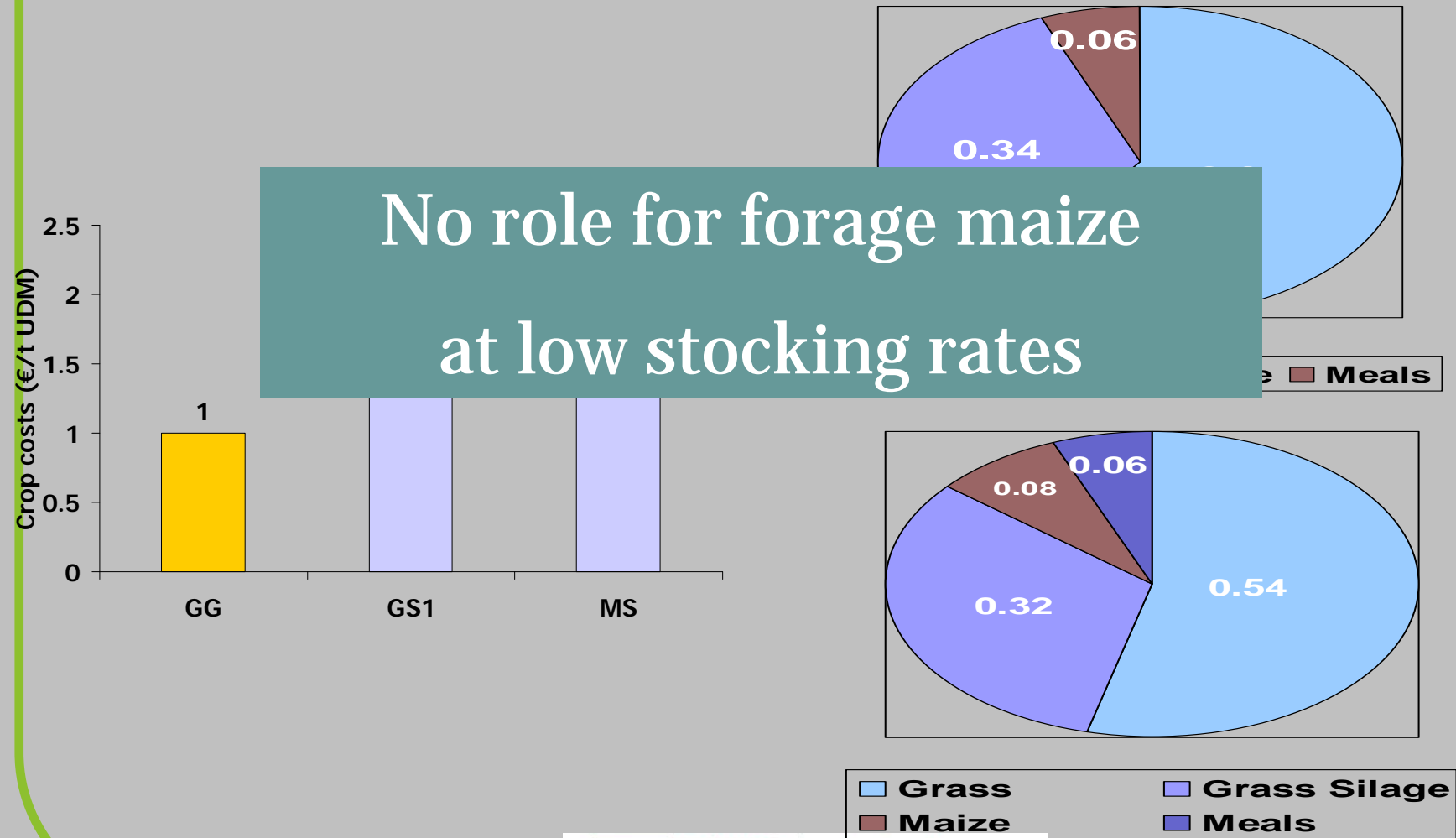
Sustainable stocking rate

2.5-2.7 LU / ha

Where is the role for forage maize in this system?

Spring Milk Production

No role for forage maize
at low stocking rates



Spring Milk Production



At high stocking rates 3.0+,

- Firstly, do not grow maize on the grazing platform
- The relative cost of forage maize vs concentrates
- Labour / equipment requirement - convenience

Cost
€ / UFL

Concentrates (€200/t)

0.21

Concentrates (€150 / t)

0.16

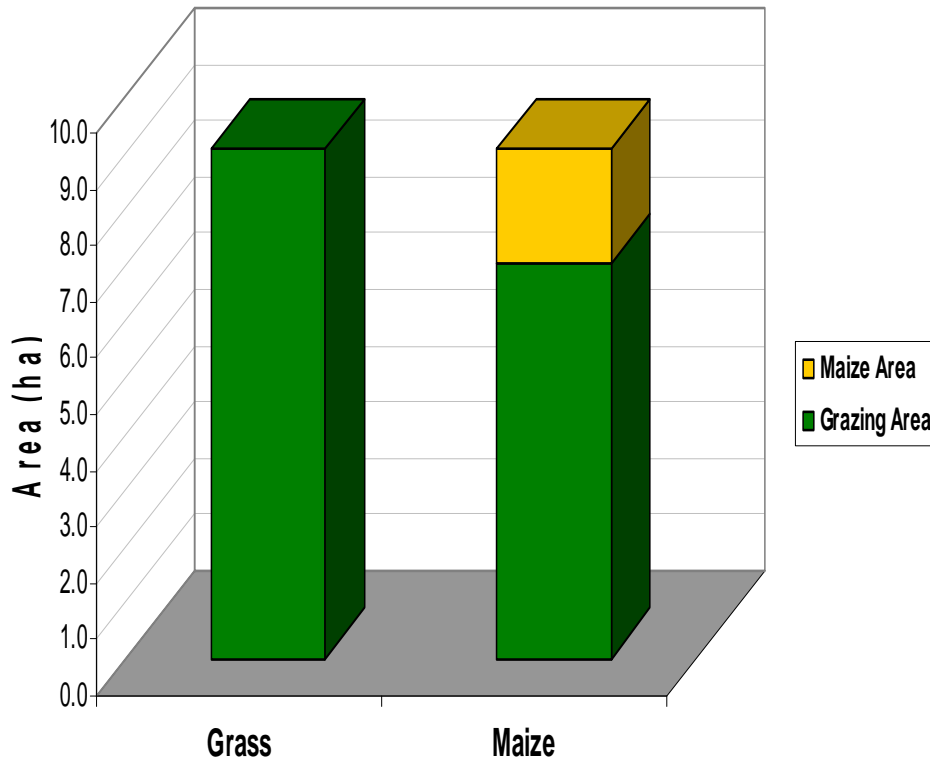
Forage maize

0.20

Winter Milk Production

Johnstown Castle (08-09)

Grass and Maize Systems at 2.7 cows/ha



100% Autumn Calving
Mean Calving 8th October

Grass

- 100% area under pasture
- Stocking rate 2.7 cows/ha
- Grass Silage & Meals

Maize

- 22% area sown as maize
- Stocking rate 2.7 cows/ha
- Grazing Platform SR is 3.4 cows/ha
- Grass/Maize Silage & Meals

Winter Milk Production

Johnstown Castle (08-09)

	GRASS	MAIZE	Diff
Milk per cow (litres)	6636	7058	422
Milk per Hectare (litres)	17,585	18,703	1118
Forage produced (t/ha)	12.5	12.0	0.5
Imported Feed (t/ha)	3.3	4.1	0.8

Johnstown Castle 2008/09

Preliminary Results

Maize Silage System

Positives

- Improved milk yield during winter period
- Increased annual milk yield per hectare
- Consistent feed?



Negatives

- Reduced total forage production
- Lower proportion grazed grass in diet – higher cost
- Cost / risk associated with growing 22% area as forage maize

Finally..... Take home messages

1. Optimum starch = 25-30% & inclusion = 33-50%
2. In a spring calving herd at SR = 2.7, forage maize has no role
3. Don't create a high stocking rate by growing maize on the grazing platform
4. In winter milk, Johnstown Castle studies:
 1. Overall forage production was reduced when forage maize was grown on the grazing platform
 2. The role of forage maize must be done on a whole farm basis
 3. High yielding crops are critical