



Grass Challenge *for dairy farmers*

Challenge Note 1A - Evaluating Milk from Forage

Contents

- 1 The Importance of Grass
- 2 Benchmarking Performance
- 3 Milk from Forage
- 4 Factors Affecting Milk from Forage
- 5 Milk from Forage Calculations

1. The Importance of Grass

Grass either as grazed grass or silage is very important in the production of milk in Northern Ireland. Grass can be produced at relatively low cost and is a very cost effective feed in the production of milk.

Grazed grass in comparison to other feeds is the cheapest source of feed available, costing approximately £30 per tonne dry matter in comparison to grass silage at £90 per tonne dry matter and concentrates at £150 per tonne dry matter.

However a recent report concluded that the feed costs of grazed grass and silage are not that straight forward particularly when fixed costs are included. (See Table below)

Table 1: *Costs of forages on Northern Ireland dairy farms (£ / tonne DM)*

	Grazed Grass	2- cut Silage	3- cut Silage	18% Dairy Cake	Whole Crop Cereals	Forage Maize (with mulch)
<i>Costs excluding fixed costs</i>	32	42	51	163	49	53
<i>Costs including fixed costs and a land charge (£250/ha)</i>	73	76	85	165	88	94

Source: Adapted from ARINI and Greenmount Campus.



The relative costs of grass, silage and concentrates will differ for each individual farm depending on their resources.

In order to lower production costs and maximise dairy enterprise margins, farmers should make the best possible use of the most important resource on their farm that is, the ability to grow and utilize grass whether in the form of grazed grass or silage.

2. Benchmarking Performance

Benchmarking is the process of comparing your dairy enterprise against similar dairy enterprises. Benchmarking allows you to pinpoint strengths and weaknesses and identify areas where your management can improve performance and thus profitability.

Useful benchmarking figures are:

- Annual milk yield per cow;
- Annual milk from forage per cow;
- Annual concentrates fed per cow.

To assist farmers in benchmarking their milk from forage the "Greenmount Benchmarking" programme can be used. To make use of this service or find out more details contact your local dairying development adviser.

3. Milk from Forage

Milk from forage is a calculation of how much of the milk produced was produced from grass and silage. It is usually calculated on a daily or annual basis and compared against targets.

Calculating the daily and annual milk from forage per cow

The simplest way is to calculate the total volume of milk produced per cow and subtract the number of litres produced by concentrates fed to the cow.

The milk produced from concentrates is calculated by assuming 0.45kg of concentrate produces 1 litre of milk. This figure is industry recognized and assumes a concentrate energy value of 13MJ/kgDM and average quality milk.

For example, a cow producing 35 litres per day being fed 6kg of concentrates per day.

Milk from concentrates = 6kg divided by 0.45 = 13 litres

Milk from forage = 35 litres minus 13 litres from concentrates = 22 litres from forage

Comparing the daily milk from forage per cow against standard values

To monitor the efficiency of milk production throughout the year, daily milk from forage values can be calculated for each month and compared against standard values. Targets are shown in Table 2.

Table 2: *Potential daily milk yields per cow produced from forage alone (litres)*

Jan	15
Feb	15
Mar	15
Apr	22
May	27*
Jun	23
Jul	19
Aug	17
Sept	15
Oct	15
Nov	15
Dec	15

Source: ARINI (*this assumes cows are grazing high quality swards and the grazing system is well managed)

Grass Challenge *for dairy farmers*

Comparing the annual milk from forage per cow

The efficiency of milk production can be compared on an annual basis by calculating the total amount of milk produced over the year and subtracting the amount of milk produced from concentrates fed to the cows over the year.

In most commercial situations 4,000 litres of milk from forage annually per cow is an achievable target.

4. Factors Affecting Milk from Forage

Month of calving – The pattern of milk produced from spring calving herds more closely matches the pattern of grass growth and can maximise milk production from grazed grass and forage. Autumn calving herds tend to have a lower milk production from forage compared to winter calving herds, which in turn have less than spring calving herds.

Level of concentrate feeding - Increasing the level of concentrate feeding will result in forage being substituted with concentrates. This decreases the forage intake and reduces milk production from forage. The optimum level of concentrate feeding will depend on the cost of concentrates versus forage and the price of milk.

Forage quality - The higher the forage quality the higher the potential milk production from forage. To achieve this potential, cows need to have access to dense leafy swards under good grazing conditions. Silage should be well fermented, a D-value between 70 - 75%, a dry matter of 25 - 30% and an ME greater than 11MJ/kg DM.

Stocking rate - To maximise milk from forage it is important that cows maximise their intakes of grass or silage. If there is a low stocking rate throughout the grazing season grass utilisation can be poor and output/ha will be lower. A balance is therefore needed between milk output/cow and milk output/ha (see Figure 1).

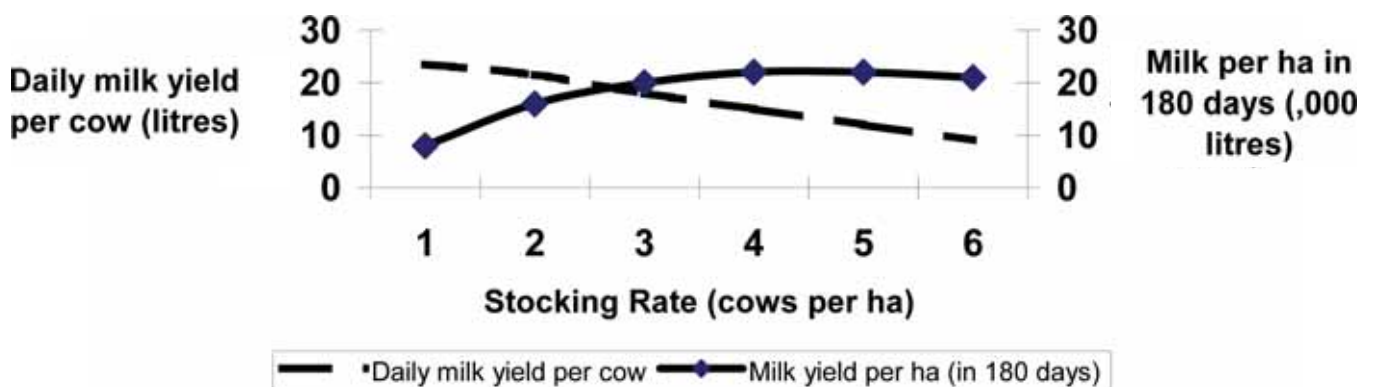


Figure 1: Effect of stocking rate on milk production per cow and per hectare

Points to note from Figure 1:

- As the stocking rate increases the level of grass utilisation decreases;
- At a stocking rate of 3 cows per hectare a balance is achieved between grass utilisation and milk yield.

5. Milk from Forage Calculations

Calculating daily milk from forage per cow

A farmer wants to assess how much milk his 80 cows produced from forage during the month of June. During the month he sold 67,100 litres of milk and fed 100 litres to calves. His cows were fed grass and supplemented with 4kg of concentrates per cow per day. To calculate his daily milk from forage he uses Table 3. To assess his milk production performance from grass he compares his actual value with the June target of 23 litres per cow per day.

Conclusion

The farmer's cows are producing 28 litres per cow per day. The amount of milk produced from forage (that is, grass) is 19 litres. This is 4 litres less than the target of 23 litres per cow per day. He concludes that he is achieving a reasonable performance from grass, but improvements could be made.

Table 3: *Example daily milk from forage calculation*

A	Milk sold during month (litres)	67,100
B	Milk fed to calves during month (litres)	100
C	Total milk produced during month (litres) (A+B)	67,200
D	Number of days in month	30
E	Average daily milk production by herd (litres) (C÷D)	2,240
F	Average number of cows milking during month	80
G	Average daily milk yield per cow during month (litres) (E ÷ F)	28
H	Daily concentrate fed per cow (kg)	4
I	Daily milk produced from concentrate (litres) (H ÷ 0.45)	9
J	Daily milk production from forage (litres) (G - I)	19
K	Potential daily milk from forage value (litres)	23
L	Difference between potential and actual figure (litres) (K - J)	4

Calculating the annual milk from forage per cow

A farmer wants to assess how much milk his 80 cows produced from forage during the year. During the 12 months he sold 562,838 litres of milk and estimates that he fed 5600 litres to calves. His cows were fed 118 tonnes of concentrate in total. To calculate his annual milk from forage he uses Table 4. To assess his milk production performance from grass and silage during the year he compares his actual value with an annual target of 4000 litres per cow per year.

Grass Challenge *for dairy farmers*

Table 4: Example annual milk from forage calculation

A	Litres of milk sold during year (Apr - Mar)	562,838
B	Litres of milk fed to calves during year (Apr - Mar)	5,600
C	Total litres of milk produced during year (A+B)	568,438
D	Average annual number of cows milking	80
E	Average annual milk yield per cow (litres) (C ÷ D)	7,105
F	Total annual tonnage of concentrates fed to milking cows	118
G	Average annual concentrate fed per cow (kg) (F ÷ D) X 1000	1,475
H	Annual milk production from concentrate (litres) (G ÷ 0.45)	3,278
I	Annual milk production from forage (litres) (E - H)	3,827
J	Target annual milk from forage value (litres)	4,000
K	Difference between target and actual figure (litres)(I - J)	-173

(Note: Calculations are based on the assumption that 0.45kg of concentrate produces 1 litre of milk)

Conclusion

The farmer's cows produced 7105 litres per cow per year. The amount of milk produced from forage (that is, grass and silage) was 3827 litres per cow per year. This was 173 litres less than the target of 4000 litres per cow per year. He concludes that he is achieving good performance from grass and silage but improvements could be made.

To determine where improvements need to be made he calculates his daily milk from forage for each month throughout the year and compares it against the targets. See Table 5.

Table 5: Milk from forage assessment table

Month	Actual MFF (litres)	Target MFF (litres)	Difference (litres)
April	19	22	-3
May	15	27	-12
June	20	23	-3
July	16	19	-3
August	14	17	-3
September	12	15	-3
October	9	12	-3
November	6	6	0
December	0	0	0
January	8	15	-7
February	8	15	-7
March	6	15	-9

From the above table the farmer concluded the following:

1. The low MFF value in May was due to cows being partly housed and fed silage because of wet weather and poor ground conditions;
2. The low values during the winter months indicate that silage quality could be improved;
3. The very low MFF value in March was due to the cows being fed 2nd cut silage as the higher quality 1st cut silage stocks were finished.