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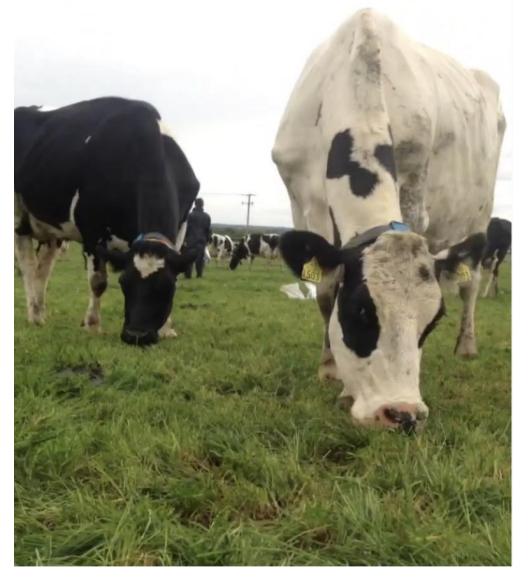
Effect of feeding press cake silage as replacement for high quality grass silage on milk production

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CHALLENGE:

- ✓ Environmental sustainability and protein source availability
- ✓ GHG emissions
- ✓ High animal feed imports into Ireland



ACTION:

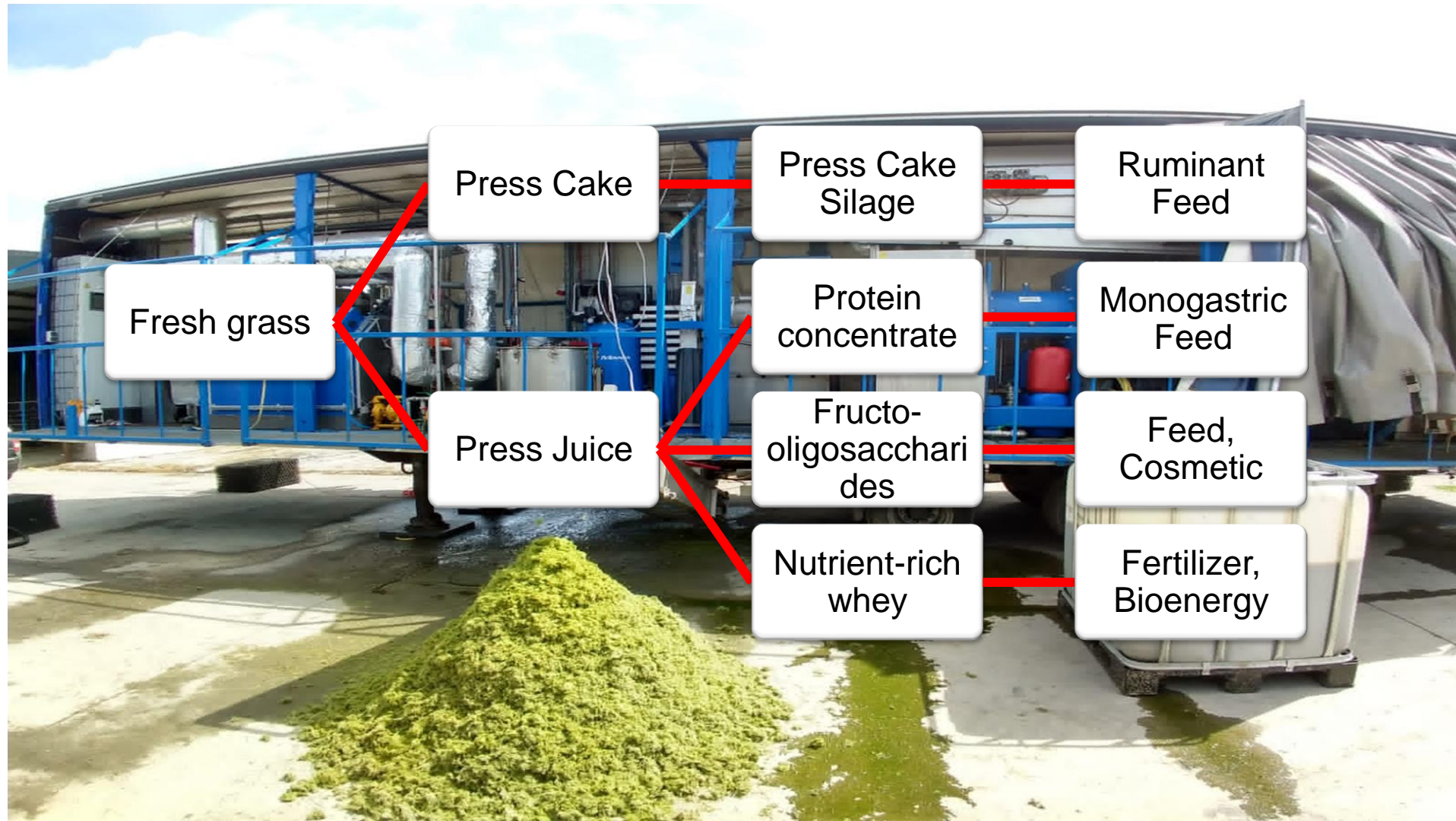
- ✓ Product diversification
- ✓ Grassland availability in Ireland
- ✓ Bioeconomy
- ✓ Biorefinery



Biorefinery process



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Objective



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To evaluate the effect of direct replacement of high quality grass silage with press cake silage in the diet of early lactation autumn-calving dairy cows on dry matter intake, milk yield and milk composition.



● Experimental feed: press cake & grass silage

PRESS CAKE SILAGE:

- ✓ predominantly perennial rye grass (*Lolium perenne*)
- ✓ harvested and processed between the July 1st to August 7th 2019 in five farms in West Cork (Ireland)

GRASS SILAGE:

- ✓ predominantly perennial rye grass (*Lolium perenne*)
- ✓ produced on UCD Lyons Farm (Ireland) on the 15th of May 2019

Experimental feed: press cake & grass silage

Experimental feedstuff

Chemical composition
(% of DM unless stated)

	Grass silage	Press cake silage	Standard concentrate	Soya bean meal
DM (%)	29.94	37.41	90	88
Ash	9.83	4.20	6.92	8.66
Crude Protein	16.44	10.93	18.82	53.25
NDF	49.09	74.09	15.35	7.54
ADF	28.97	41.33	7.86	4.16
WSC	4.26	3.56	-	-
Starch	1.55	1.33	48.6	2.58
Ether extract	3.46	2.82	2.52	1.29
Gross energy (MJ/kg of DM)	17.65	18.30	17.70	19.60



● Experimental design

- **Experimental animals** : 30 dairy cows (70 DIM, 31kg milk yield /day, 4.3% fat, 3.7% protein)
- **Experimental design** :
 - two treatments (GS & PC)
 - randomised complete block design (n=15)



0 day

14 day

77 day

Acclimatization period	Experimental period: daily feed intake recording, milk sampling and milk yield recording once a week
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● Experimental design

Experimental diets: direct replacement of 2/3 of grass silage with press cake silage

	GS	PC
Grass silage	14 kg DM	5 kg DM
Press cake	-	9 kg DM
Standard concentrate	7.2 kg DM	7.2 kg DM
Soya bean meal	0.44 kg DM	0.44 kg DM

	Diets	
Chemical composition (% of DM unless stated)	GS	PC
DM (%)	41.18	48.63
Ash	10.04	6.75
Crude Protein	18.02	15.22
NDF	37.33	56.94
ADF	22.52	27.07
WSC	4.61	2.25
Starch	3.55	4.42
Ether extract	4.68	2.55
Gross energy (MJ/kg of DM)	17.98	18.15

- **Sampling and analysis**

Daily feed intake was recorded using computerised feeding stations (Insentec)



Milk yield and milk samples were carried out using the milk meter system in the milking parlour (Dairymaster)



Statistical analysis: all the data from this study were analysed using the proc mixed procedure of SAS (version 9.4)



RESULTS:
Dry matter
intake

Item	Treatment			
	GS	PC	SEM	<i>P</i> -value
DMI (kg DM/d)	19.33	18.00	0.342	0.01
Feed efficiency	1.31	1.27	0.024	0.24



RESULTS:

Milk composition

Item	Treatment			
	GS	PC	SEM	<i>P</i> -value
Milk production (kg/d)				
Milk yield	28.02	27.33	0.724	0.51
Fat	1.28	1.18	0.031	0.03
Protein	0.97	0.94	0.019	0.34
Milk solids	2.24	2.11	0.046	0.05
ECM (kg)	24.94	23.33	0.044	0.04



RESULTS:

Milk quality

Item	Treatment			
	GS	PC	SEM	<i>P</i> -value
Milk composition %				
Fat	4.58	4.36	0.113	0.24
Protein	3.47	3.44	0.071	0.79
Urea (g/100g of milk)	0.027	0.024	0.0007	0.01
SCC (x 10 ³ cells/mL)	27	29	3.613	0.06



Conclusions

- ✓ **Press cake silage can act as a partial replacement for high quality grass silage in the diet of early lactation dairy cows without a negative impact on milk solids yield and milk composition.**



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THANK YOU.

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Dairy industry in Ireland:

- ✓ Pasture based system
- ✓ 1.5 million dairy cows
- ✓ Focus on export

