

# The effect of sample handling and storage on the nutritional value of fresh grass

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## Introduction

- Fresh grass analysis, by supplying information on grass dry matter (DM), crude protein (CP), water soluble carbohydrate (WSC) and metabolisable energy (ME) content, can be an important tool in managing grazing cow diets throughout the season.
- Near Infrared Reflectance Spectroscopy (NIRS) is a cheap and reliable laboratory technique for analysing the nutritional value of forages.
- However, between the time of sampling and analysis in the laboratory, plant degradation processes may take effect, resulting in poor analysis results.



## Aims

To examine the effect of harvesting technique and storage conditions on the nutritional value of fresh grass.

## Methods

- An established perennial ryegrass sward was managed under a simulated grazing regime during summer 2015.
- Grass quality was analysed at four of the eight grass harvests throughout the season
- At each harvest, 26 treatments were examined:
  - Harvesting technique (**Pluck** or **Cut**)
  - Storage duration (**Immediate**, **24-hour** or **48-hour** analysis)
  - Storage temperature (**Ambient** (average, 15.2°C) or **Chilled** (4°C))
  - Storage conditions (**Air present**, **Air excluded** or **Breathable**).
- The effect of storage duration, temperature and conditions were also examined for silage sward samples.
- All samples were analysed fresh using NIRS for DM, CP, WSC, acid detergent fibre (ADF) and ME.



## Results

For simulated grazing swards:

- Hand plucked samples tended to have higher CP (8 g/kg DM) and ME content than cut samples
- Changes in grass quality due to storage were small however storing samples under ambient temperatures, in breathable bags for 48 hours led to the greatest sample deterioration (Figure 1)
- Samples stored for 48-hours had a lower WSC (9 g/kg DM) and ME content (0.12 MJ/kg DM)
- Samples stored at ambient temperature had a lower WSC (12g/kg DM) and ME content (0.17 MJ/kg DM)

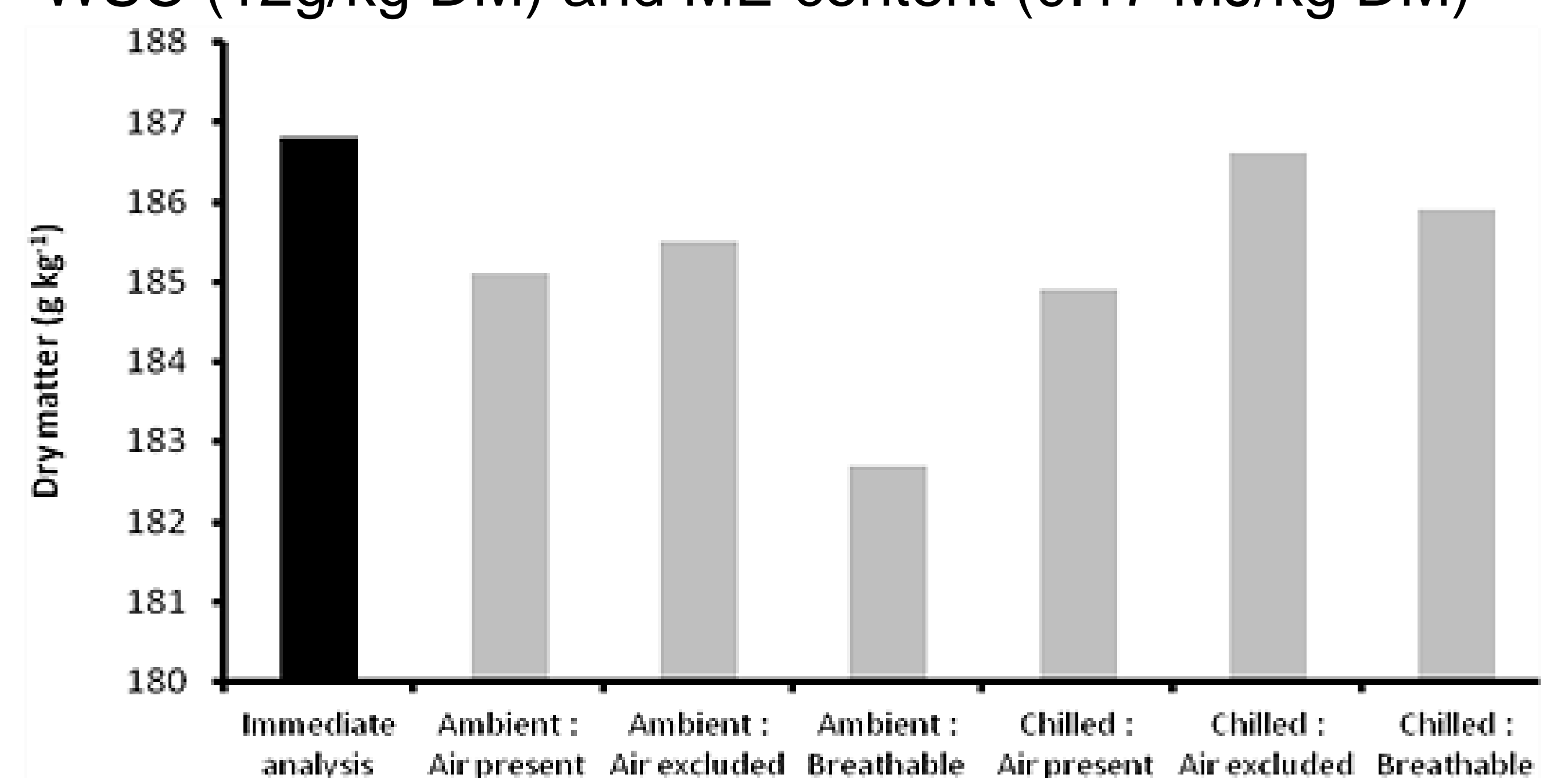
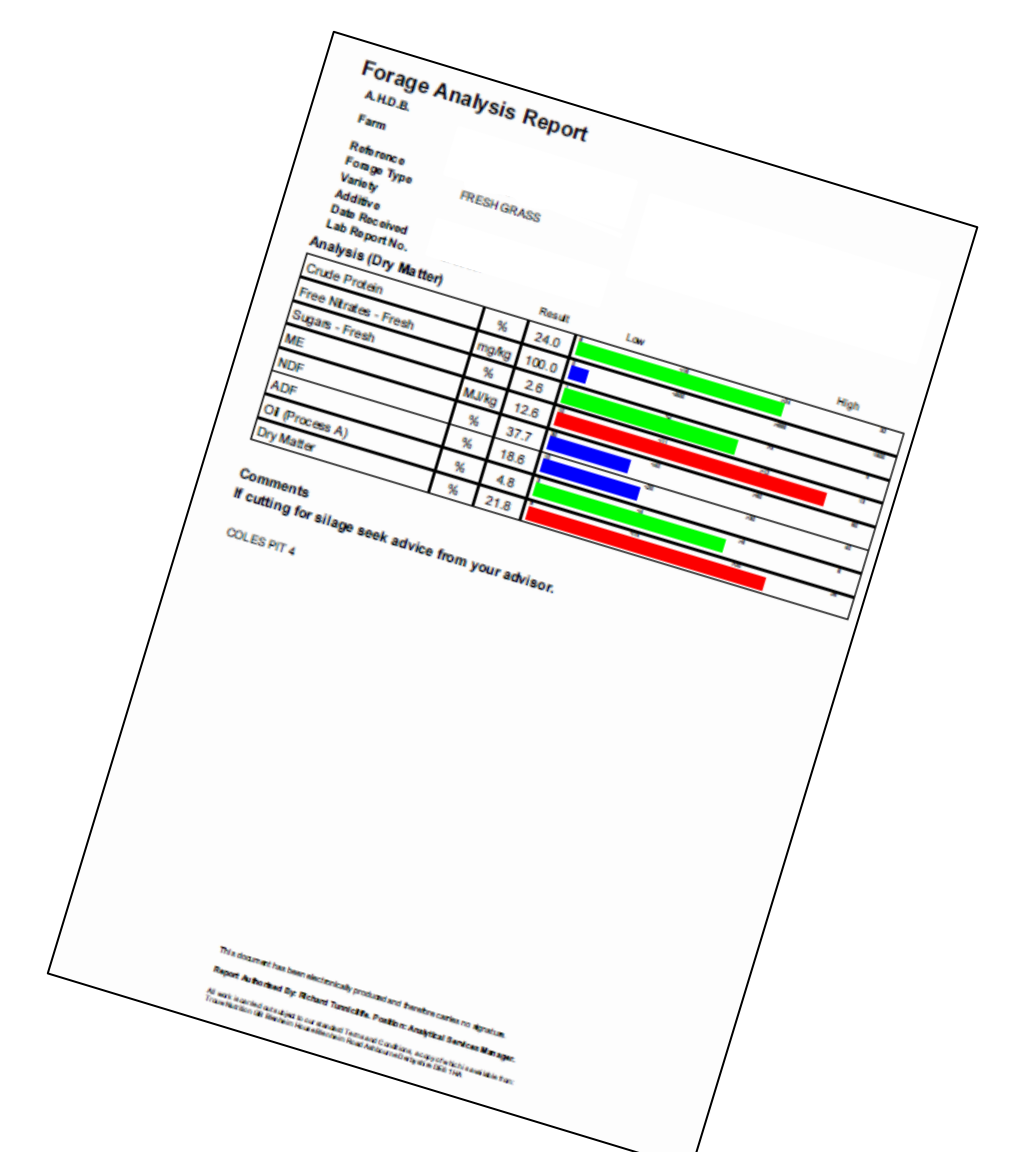


Figure 1: The impact of storage time, storage temperature and the presence of air during storage on grass dry matter content from grass from simulated grazing swards

- There was limited effect of sampling or storage on crude protein content
- Grass from silage swards did not deteriorate if stored for 48 hours but had a higher WSC (18g/kg DM) and ME content (0.26 MJ/kg DM) when stored chilled.

## Grass sampling protocol

- Take samples early in the week
- Aim to cut samples immediately before posting
- Using scissors, cut a large handful of grass to your target residual at a minimum of 6 locations across the paddock
- Place into a bucket and mixed gently
- Take a subsample from the bucket and place into the sample bag avoiding overfilling the bag.
- Gently squeeze the air out of the bag and seal
- Send to the lab via first class post



NB: Samples which are taken more than two hours before posting should be stored in the refrigerator in a sealed bag.

This study forms part of AHDB Dairy's Research Partnership

For more information, visit: [dairy.ahdb.org.uk](http://dairy.ahdb.org.uk) or contact Dr. Debbie McConnell, Email: [debbie.mcconnell@ahdb.org.uk](mailto:debbie.mcconnell@ahdb.org.uk) Tel: 024 7647 8704