

# Whole plant, starch and cell wall digestibility of maize silage



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## INTRODUCTION

Maize silage is composed of two main energetic fractions, cell wall and starch, which vary in proportion among varieties and maturity stages, and have a different rate and extent of digestion.

A better understanding of whole plant **organic matter digestibility (OMd)** variation requires to investigate starch and cell wall digestibility.

## OBJECTIVE

Analyse whole plant, starch and cell wall digestibility of maize silage in order to improve evaluation of its energetic value

## METHODS

### 16 maize silages

- 4 genotypes (A, B, C, D)  
 4 stages of maturity from 27% (milk-dough) to 42% of DM (flint)



### In vivo digestibility measurement

→ A Latin square design for each variety  
 → Each period = 12 days (6 days for acclimatisation phase prior to 6 days measurement phase)

Sixteen sheep housed in metabolic crates



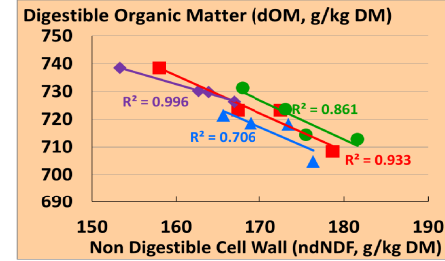
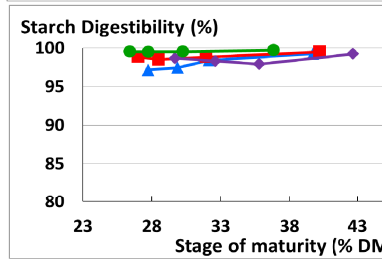
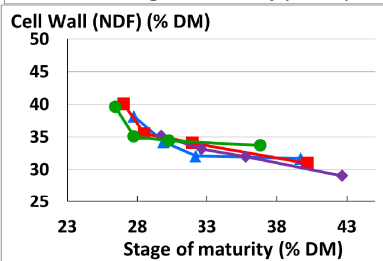
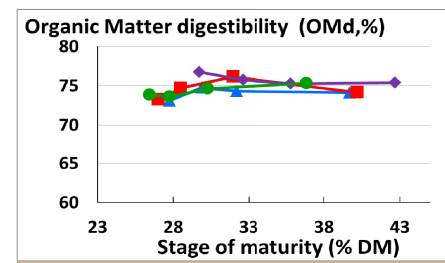
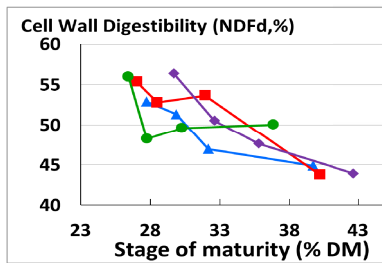
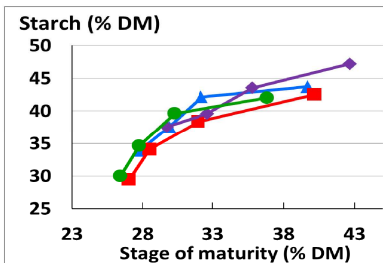
Maize silage offered in limited quantity (40g DM/kg P<sup>0.75</sup>)

## RESULTS

### Chemical composition

### In vivo Digestibility

★ Variety A    ★ Variety B    ★ Variety C    ★ Variety D



Chemical composition (P-value)	Variety	Stage of maturity	Variety* stage of maturity
NDF	<0.0001	<0.0001	0.43
Starch	<0.0001	<0.0001	0.60

In vivo Digestibility (P-value)	Variety	Stage of maturity	Variety* stage of maturity
OM	0.02	0.37	0.22
NDF	0.77	<0.0001	0.05
Starch	<0.0001	<0.0001	<0.0001

## CONCLUSIONS

With maturity stage, the increase in starch content and the decrease in NDF content of the plant **compensate the decrease in NDF digestibility**, leading to a rather **constant evolution of OMd**.

As OMd variations are closely linked with non digestible cell-wall content, predicting the **non digestible cell-wall fraction** will help to predict whole plant digestibility

