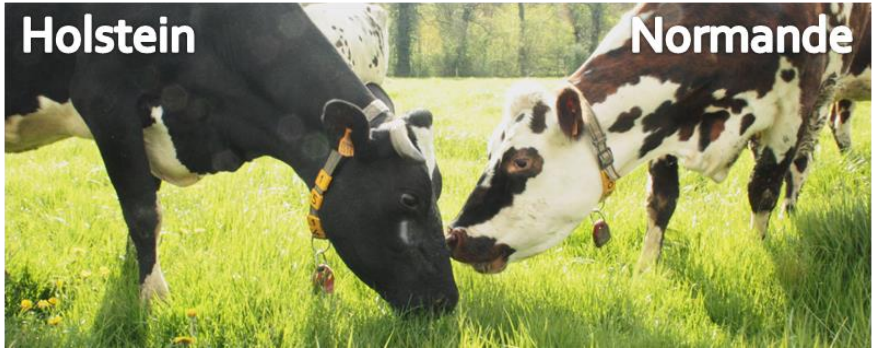
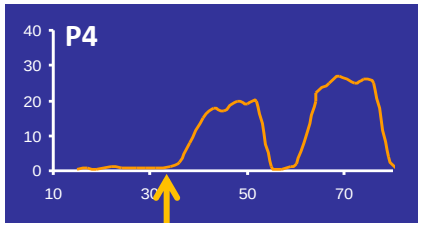
EAAP 66th annual meeting,
Warsaw 2015

Resumption of luteal activity in first lactation cows is mainly affected by genetic characteristics



Bedere, N.[1], Delaby, L.[1], Ducrocq, V.[2], Leurent-Colette, S.[3], Disenhaus, C.[1]
[1]INRA – AGROCAMPUS OUEST UMR 1348 PEGASE, Saint-Gilles, France
[2]INRA UMR 1313 GABI, Jouy-en-Josas, France
[3]INRA UE 326 Domaine Expérimental du Pin-au-Haras, Exmes, France

Numerous works on resumption of luteal activity in dairy cows



Genetic characteristics

Breed,
EBV for Milk Yield

CLA

Underfeeding

BCS at calving,
ΔBCS, ΔBW,
NEB

Windig et al.,2008,
Garmo et al., 2009
Friggens et al.,2010…

Energy exported in milk

Milk Energy (kJ/d) = 7115 × Milk Yield × {0.44 + [0.0066 × (Fat Content – 40)]
+ [0.0033 × (Protein Content – 31)]}

Faverdin et al. (2007)

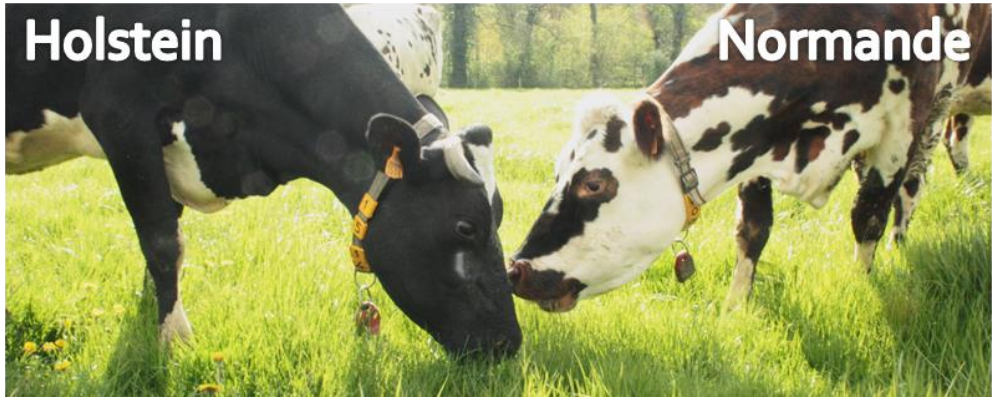
Does the genetic predisposition to export energy in milk through high Milk Yield or through high Fat and Protein Contents have an impact on post partum cyclicity ?

Does an underfeeding strategy which leads to decrease energy exported in milk have a positive impact on post partum cyclicity ?

Experimental design:

194 first lactation cows from 2006 to 2013

2 Breeds



2 Genetic groups per breed

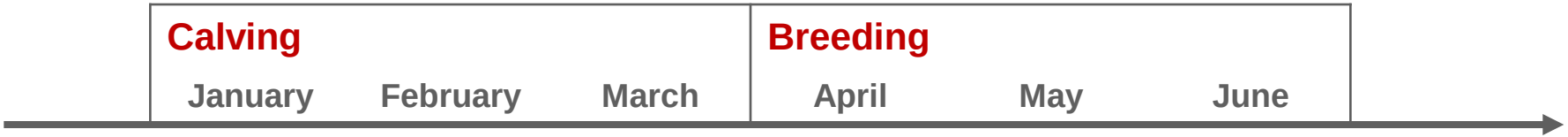
MILK CONTENT

Equal genetic merit for total energy exported in milk (kJ/d)

Experimental design:

194 primiparous cows from 2006 to 2013
Compact calving system

2 feeding systems



HIGH	TMR 55% Maize sil., 15% Alfalfa pel., 30%C	PASTURE + 4 kg C
LOW	50% Grass silage, 50% Haylage	PASTURE

Data analyses

- ANCOVA using R's lm procedure : effect of experimental factors and their interactions on zootechnical performances

- Survival analyses, using Survival Kit

Ducrocq and Sölkner (1994)
Mészáros et al. (2013)

$$h(t; x, z) = h_{0,breed}(t) \quad \exp\{x'\beta + z'(t)\varphi\}$$

Instantaneous risk of CLA regarding explanatory variables

Average instantaneous risk of CLA regarding breed

Explanatory variables
x' = constant variables: Calving problems, Genetic group, $EBV_{MY,}$ BW 1st week
z' = time-dependent variables: BW change

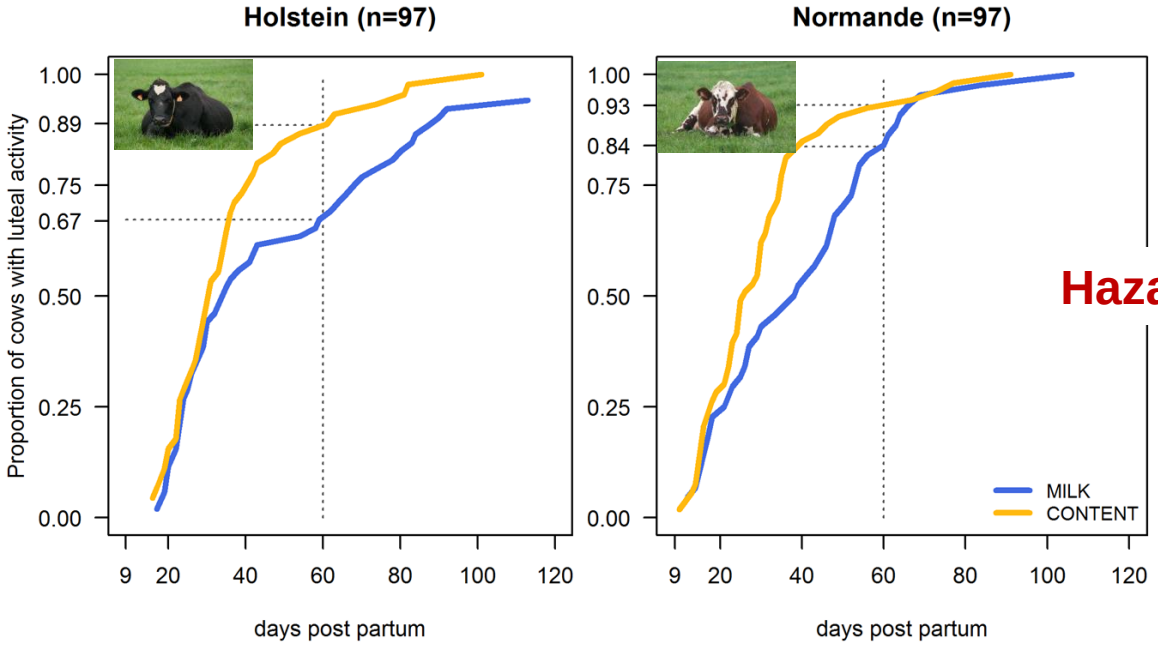
Results in 3 sentences

1 – **Breed** had an effect on resumption of pp ovarian activity

2 – Within breed, **Content** cows showed CLA earlier than **Milk** even though **energy exported in milk** was similar

3 – **Feeding strategies** had no effect on CLA even though **energy exported in milk** was different

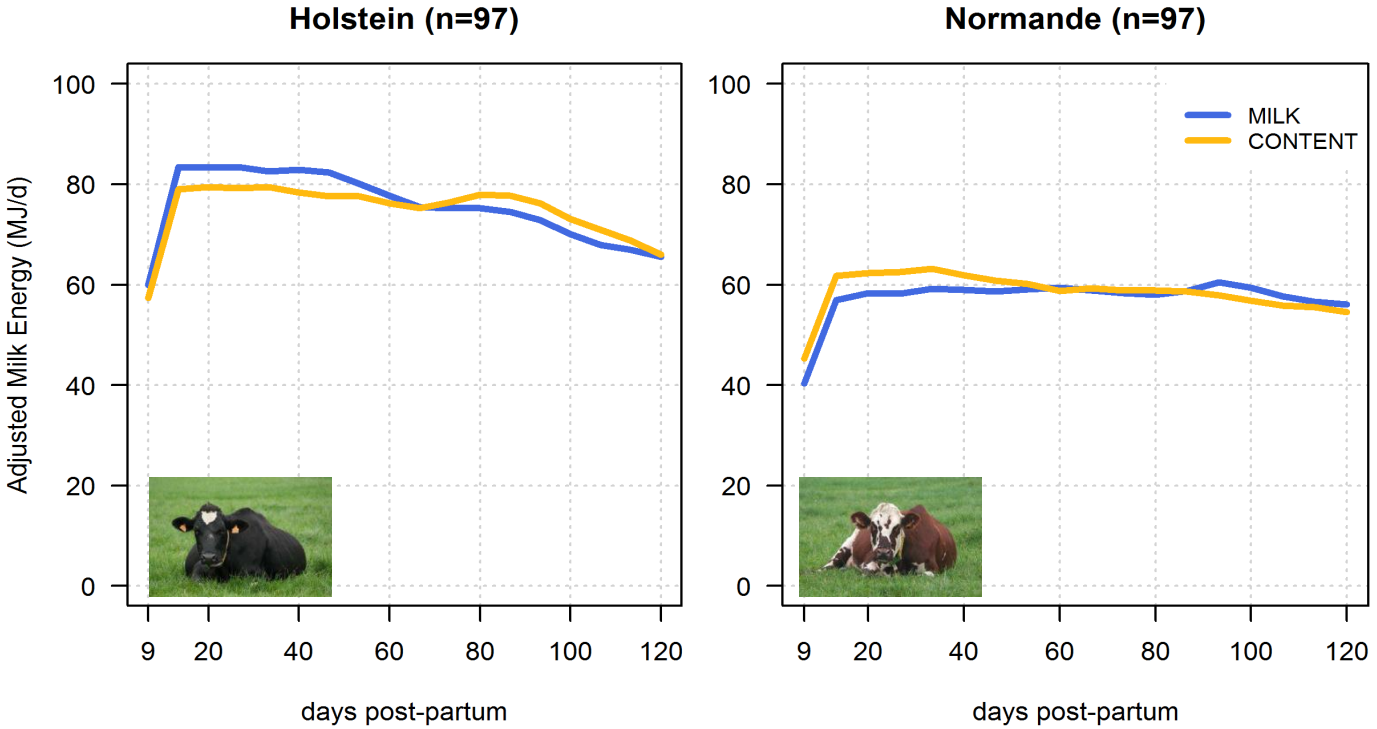
Within breed Content cows show CLA earlier than Milk ones



Hazard Ratio = 2 (P < 0.001)

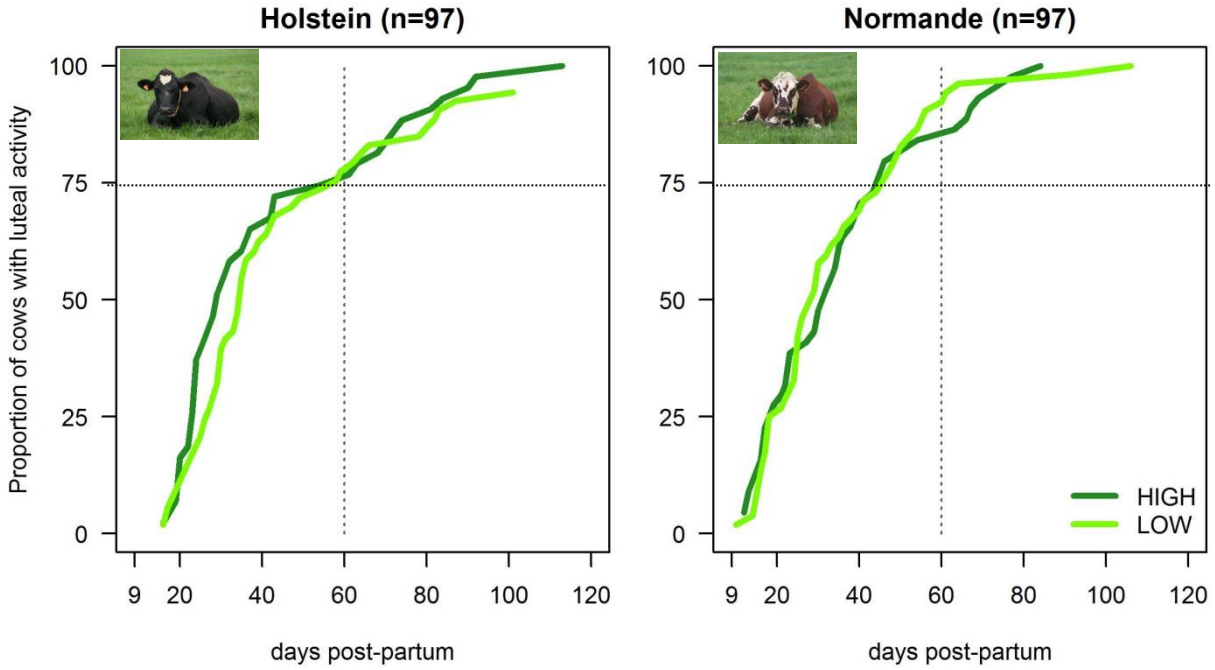
EBV for Milk Yield stays negatively associated to CLA (P<0.05)

But energy exported in milk was similar for both genetic groups

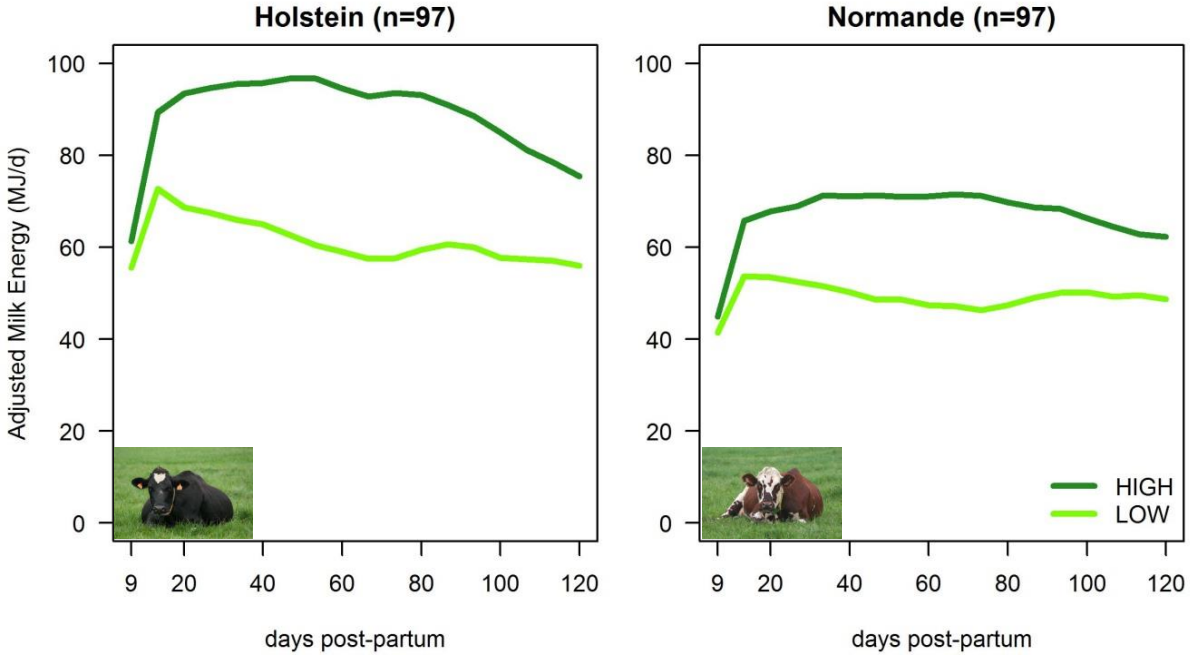


Only the « way » of exporting energy was different

Feeding strategy had no effect on CLA



But feeding strategy had a very strong effect on energy exported in milk



(P < 0.001)

In conclusion (1)

, a genetic predisposition to export energy in milk through high Fat and Protein Contents have a positive impact on resumption of luteal activity in first lactation cows.

- Effect on estrus expression and fertility ?
- Same effect in older cows ?

, an underfeeding strategy which leads to decrease energy exported in milk did not have any impact on post partum cyclicity in first lactation cows.

- Discrepancy with the literature: due to parity ?

In conclusion (2)

- Within breed, **Content** cows showed CLA earlier than **Milk** even though energy exported in milk was similar
- **Feeding strategies** had no effect on CLA even though energy exported in milk was different

Energy exported in milk is not the link in first lactation cows

Thank you for attention