Milk production and fertility performance of Holstein, Jersey and Holstein x Jersey cows in the Irish national dairy herd

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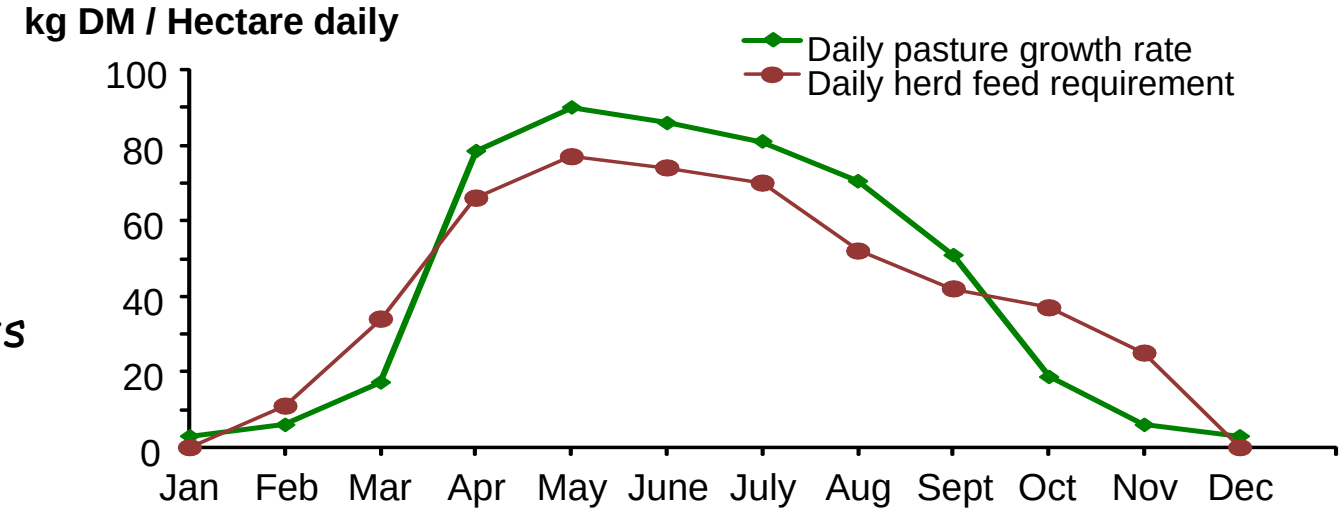
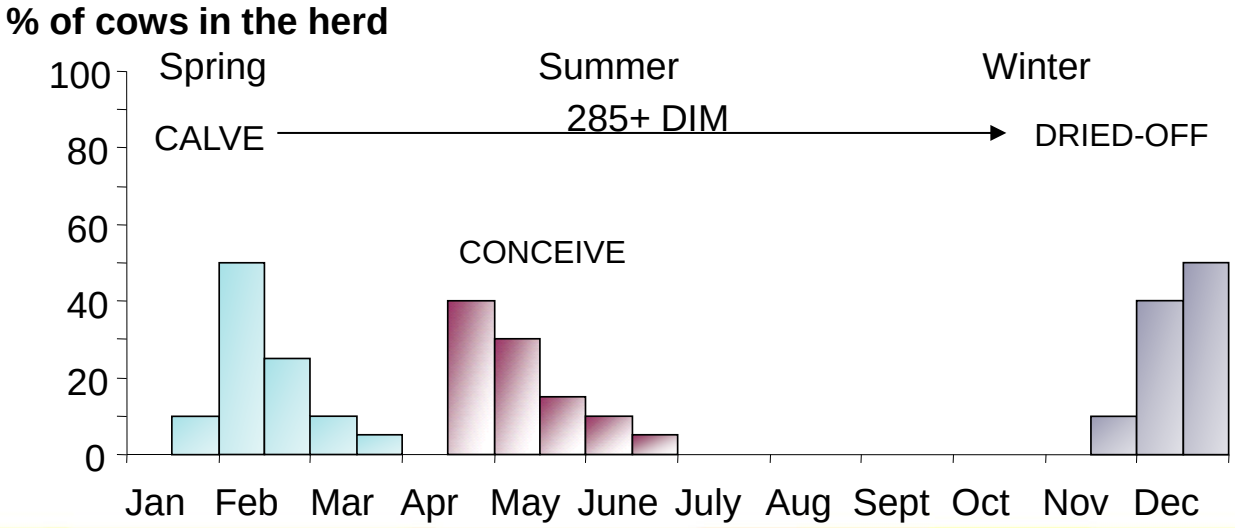
The Irish Agriculture and Food Development Authority

Grass-based seasonal system

Alignment
grass supply
&
animal requirements

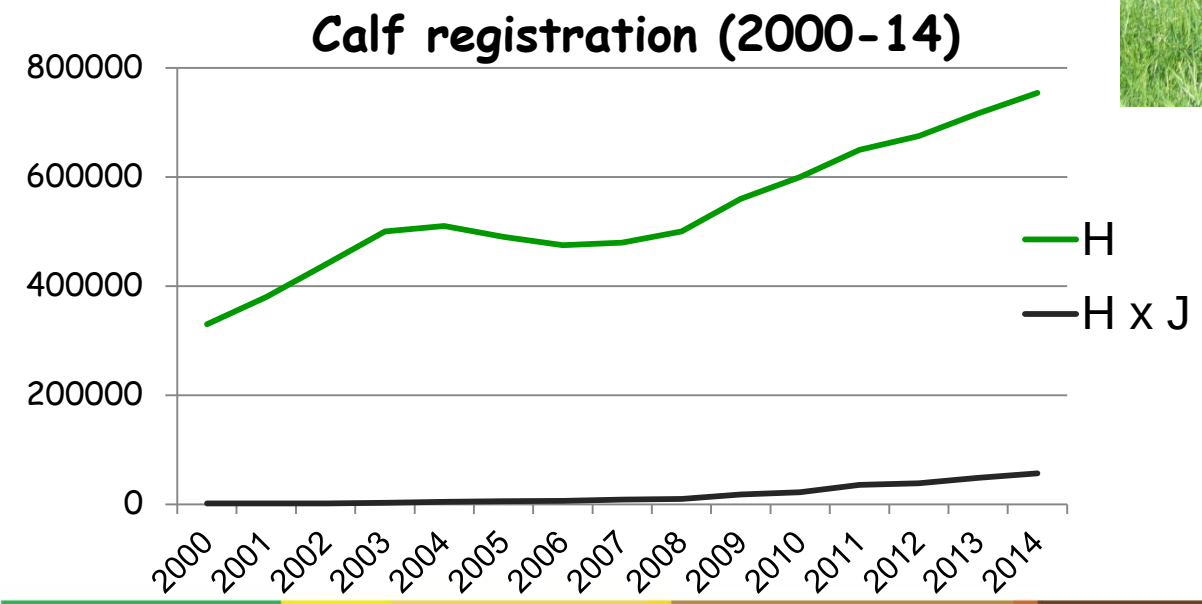


Compact calving
High EBI
High fertility status
dairy herd



Key Characteristics of the Grazing Cow

- ✓ Highly fertile-365 d calving interval
- ✓ High grass DMI (16-20kg/DM/day)
- ✓ Productivity (1,200-1,400kgMS/ha)
  (15,000-17,000 litres/ha)
- ✓ Average 5 lactations



Background

- (Inter)national research has shown benefits to the H x J cow relative to both parental breeds
  - Milk production (Prendiville *et al.*, 2010; Dillon *et al.*, 2007)
  - Fertility (Prendiville *et al.*, 2011; Sneddon, 2011; Vance *et al.*, 2011)
  - Feed efficiency (Grainger and Goddard, 2004; Prendiville *et al.*, 2010)
  - Survivability (Lopez-Villalobos *et al.*, 2000; Dillon *et al.*, 2007)
  - Profitability (Prendiville *et al.*, 2011; Buckley *et al.*, 2007)
- Controlled environment – limited by scale

Objective

Compare the biological performance of Holstein, Jersey and Holstein x Jersey cows in commercial spring calving dairy herds practicing crossbreeding in Ireland

Data

- **Herd criteria;**

1. Spring calving (>80% calved between 1st Jan and 31st May)
2. A mixture of H, J and H x J cows
3. Years 2008-2012 inclusive

- 24,279 cows from 40 herds (ICBF database)

Statistical analysis

- Contemporary group : Herd – Year – Season grouped by calving date

- Data were analysed using Linear Mixed Models

Statistical analysis - ASREML

- **Linear mixed models** estimated the least square means of milk production and fertility traits
- $Y = \sum_{i=1}^{3} breed_i + heterosis + recombination\ loss + parity + cow + herd_{year_{season}} + residual$

Dependent variables (Y):	Fixed effects:	Random effect:
Milk yield	Breed	Cow
Fat yield	Heterosis	Contemporary group
Protein yield	Recombination loss	Residual
Age at 1st calving	Parity	
Calving interval		
Submission rate		

Results

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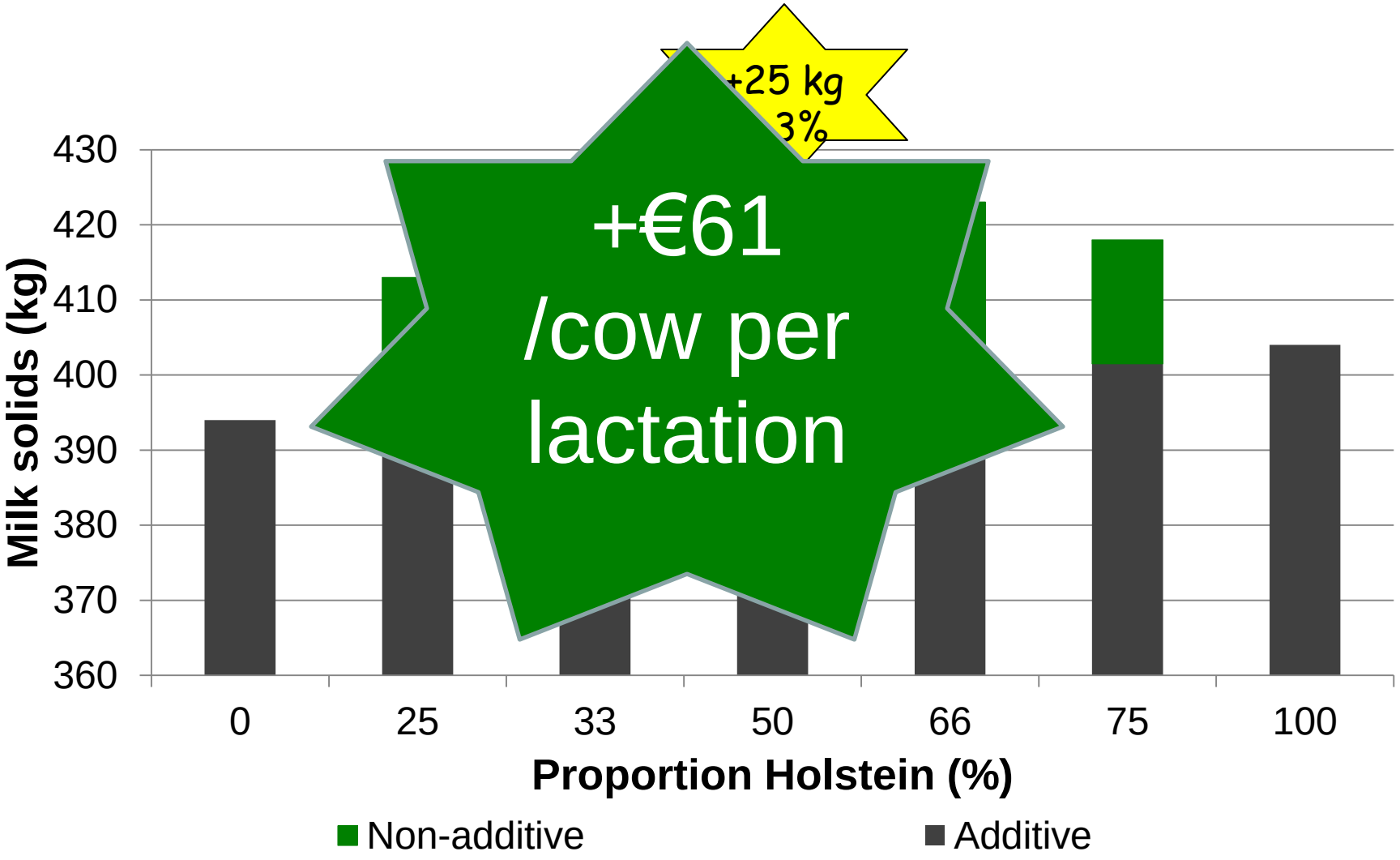
Milk production performance

	Holstein	Jersey	Holstein x Jersey
Milk yield (kg)	5217	4230	+264 kg 5.6%
Milk solids yield (kg)	404	395	424
Fat yield (kg)	218	226	236
Protein yield (kg)	186	169	188
SCS	5.0534	5.0613	4.9017

Milk Solids Production

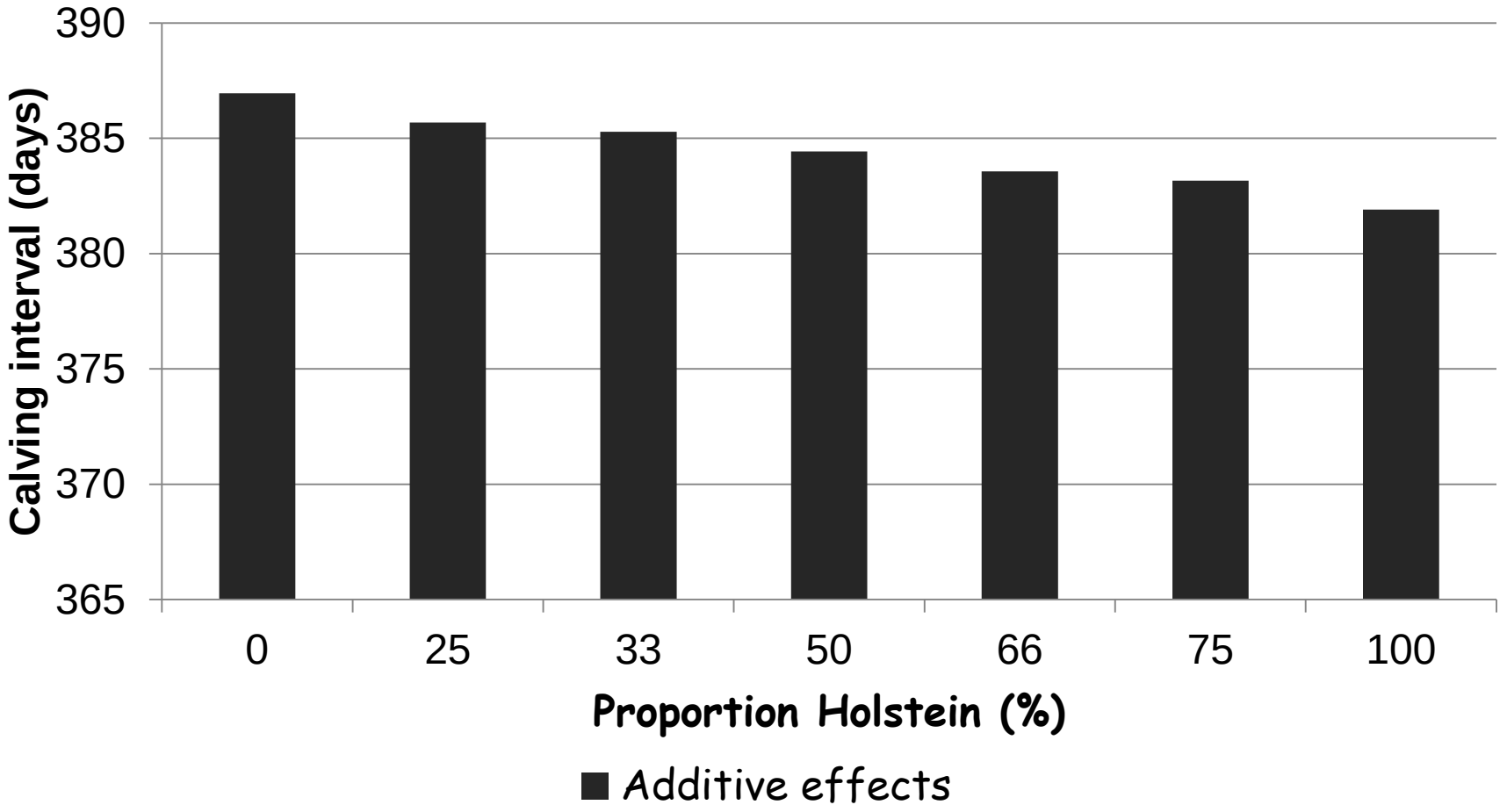


Fertility performance

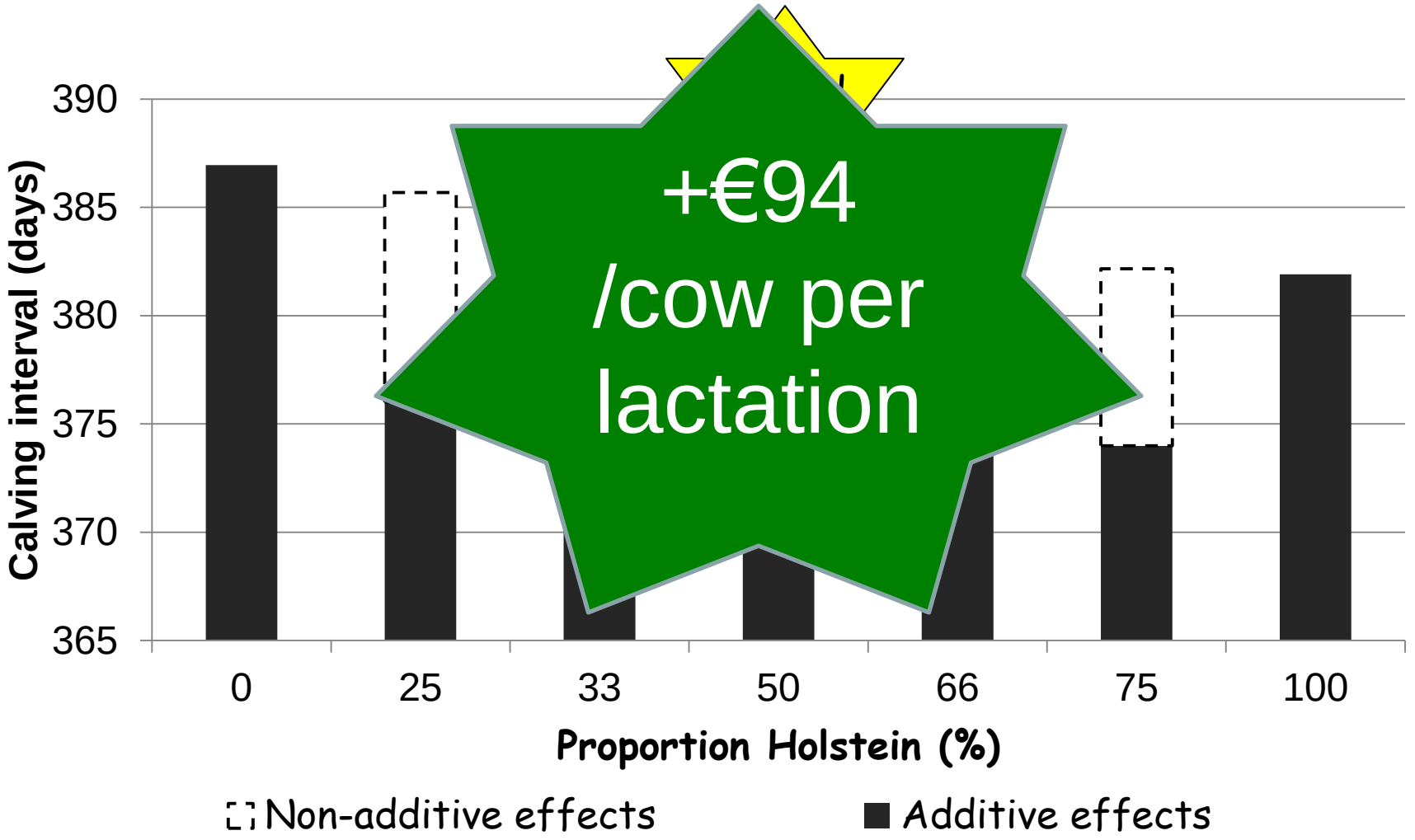
	Holstein	Jersey	Holstein x Jersey
AFC* (d)	744	762	741
CIV* (d)	382	387	377
SR* (%)	68	74	75

*AFC = Age at 1st calving; CIV = Calving interval; SR = Submission rate

Calving interval



Calving interval



Conclusion

- Superior animal performance in crossbreds
  - Greater milk solids
  - Lower SCC
  - Improved fertility performance
- Profitability maximised in crossbreds
  - Additional profit €155 /cow per lactation

Results consistent with those observed in a controlled environment

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NDP National Development Plan

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