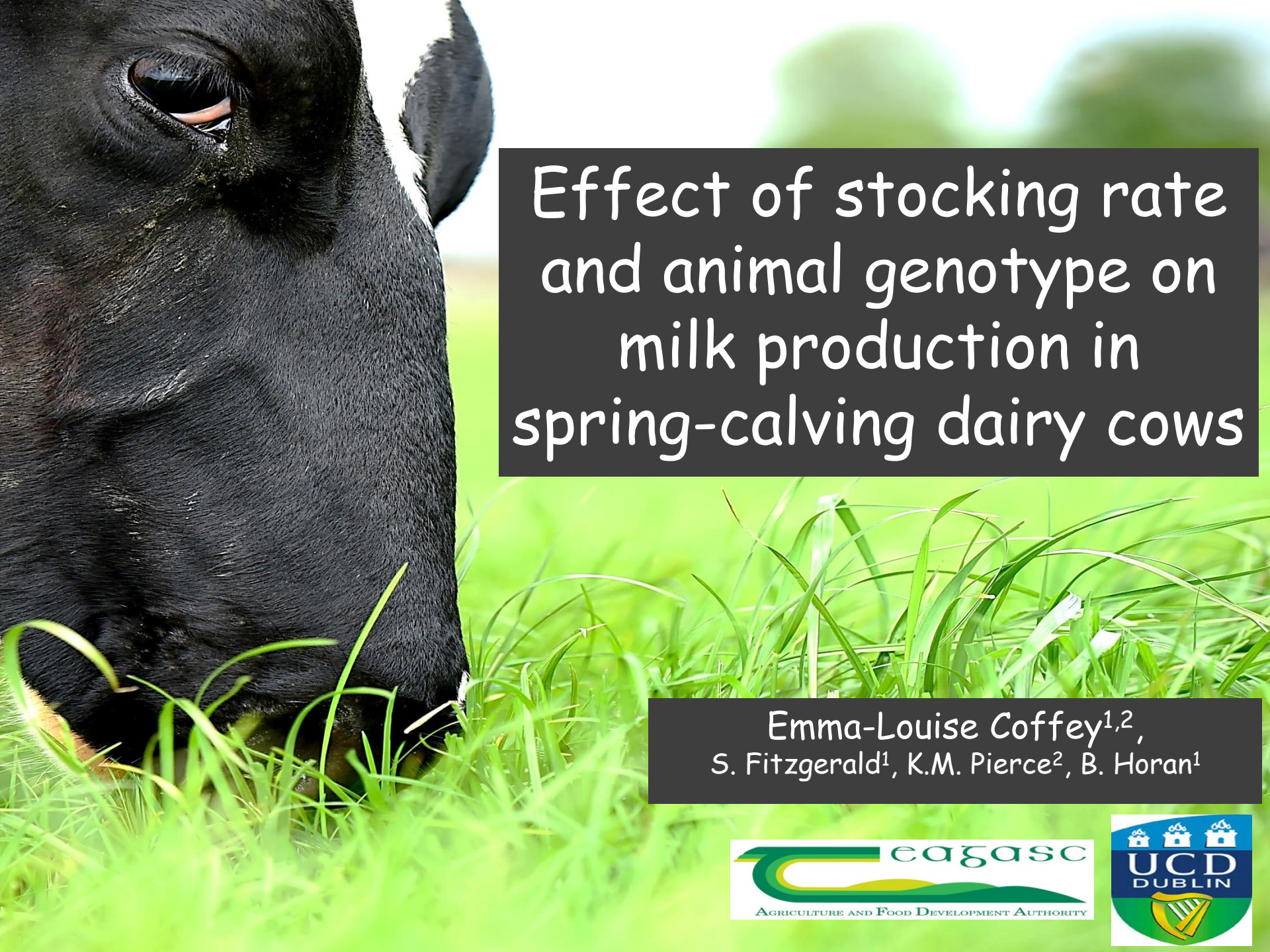

Effect of stocking rate and animal genotype on milk production in spring-calving dairy cows

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S. Fitzgerald[1], K.M. Pierce[2], B. Horan[1]

teagasc
Agriculture and Food Development Authority

UCD DUBLIN

Implications of increasing stocking rate (SR)

- Milk production - 9% ↓ per cow, 20% ↑ per ha (McCarthy *et al.*, 2011)
  - ↓ DHA, ↓ DMI per cow at higher SR (McCarthy *et al.*, 2014)
  - ↑ grass utilisation per ha, ↑ feed quality (Macdonald *et al.*, 2008)

Suitable dairy cow

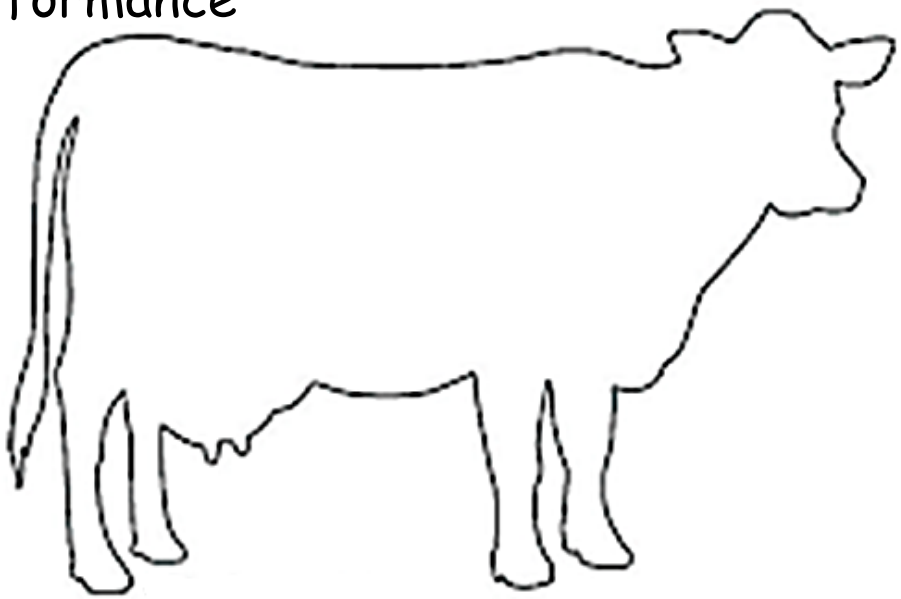
High value MS

- Feed intake
- Liveweight

Reproductive performance

Health status

Longevity



Easy care

Resilient

Low environmental footprint

Berry (2014)

Suitable dairy cow

- (Inter)national research has shown benefits to the HF x J cow
  - Milk production (Coffey *et al.*, 2016; Penasa *et al.*, 2011; Prendiville *et al.*, 2011)
  - Fertility (Coffey *et al.*, 2016; Buckley *et al.*, 2014; Vance *et al.*, 2013)
  - Feed efficiency (Vance et al., 2012; Prendiville *et al.*, 2009; Grainger and Goddard, 2004)
  - Survivability (Lopez-Villalobos *et al.*, 2000; Dillon *et al.*, 2007; Harris *et al.*, *2011*)
  - Profitability (Buckley *et al.*, 2015; Kelleher et al., 2015; Prendiville *et al.*, 2011)

- Crossbred cattle outperform purebreds on Irish farms

	Hol	Jer	Hol x Jer
Milk solids (kg)	404	395	425
Calving interval (d)	382	387	377

Coffey *et al.*, 2016

Experimental Design

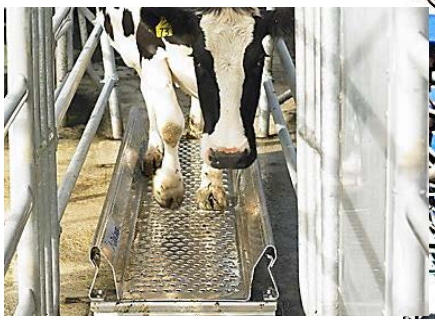
Low **Medium** **High**

22 HF 23 HFxJ 23 HF 24 HFxJ 23 HF 24 HFxJ

- Cows randomised within based on genetic merit (EBI), calving date and parity

Animal & grass measurements

- Milk yield
- Milk constituents
- Body weight & BCS



Statistical analysis – Linear mixed models

Dependent variables	Milk production traits Body weight & body condition score
Fixed effects	Year Calving date Parity Stocking rate Breed Stocking rate * Breed
Random effects	Cow Residual

Results

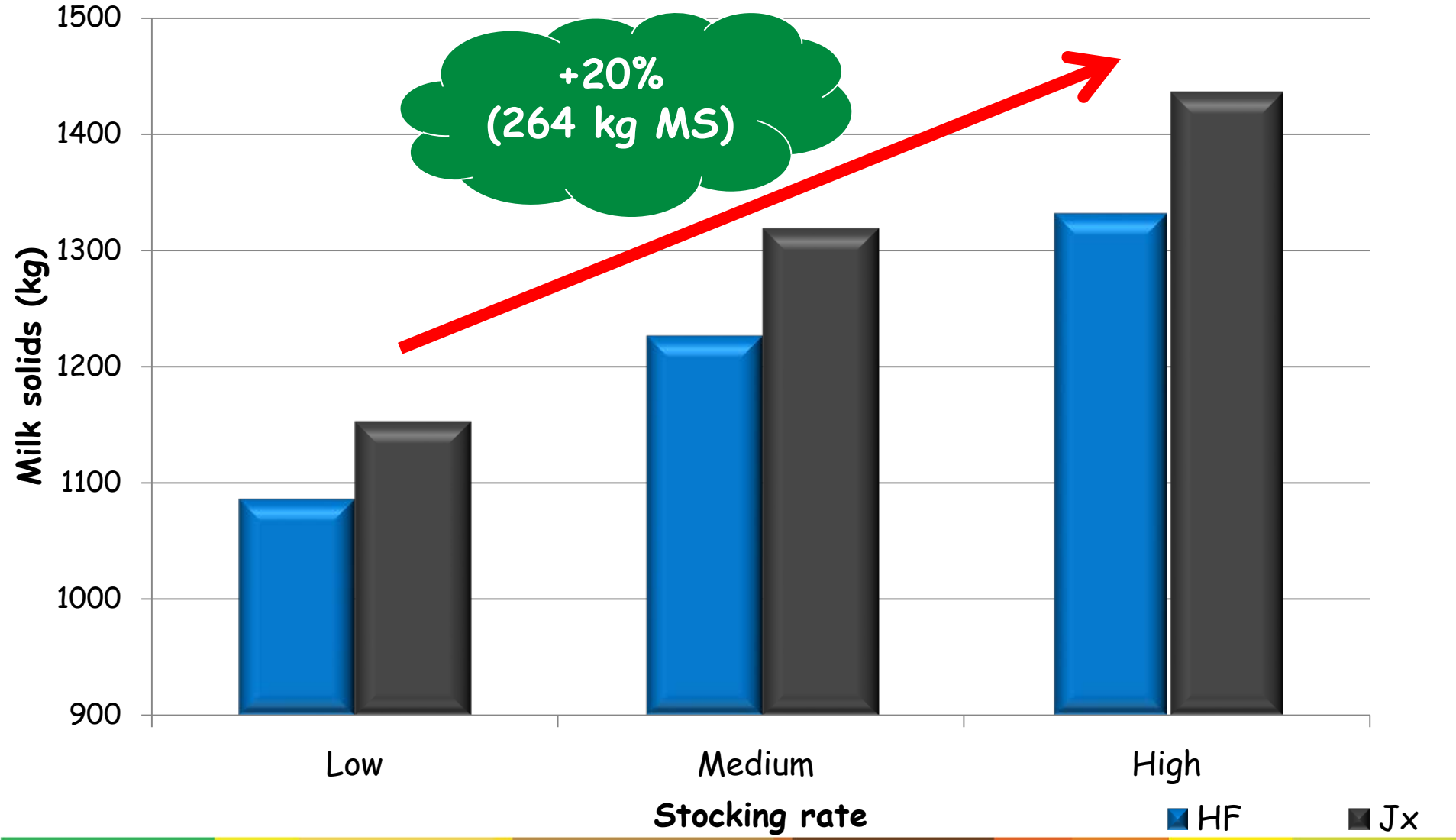
Grazing characteristics

SR	Low		Medium		High		P-Value		
Breed	HF	JX	HF	JX	HF	JX	SR	B	SR*B
Post GSH (cm)	4.45	4.50	3.89	3.92	3.51	3.53	***	NS	NS

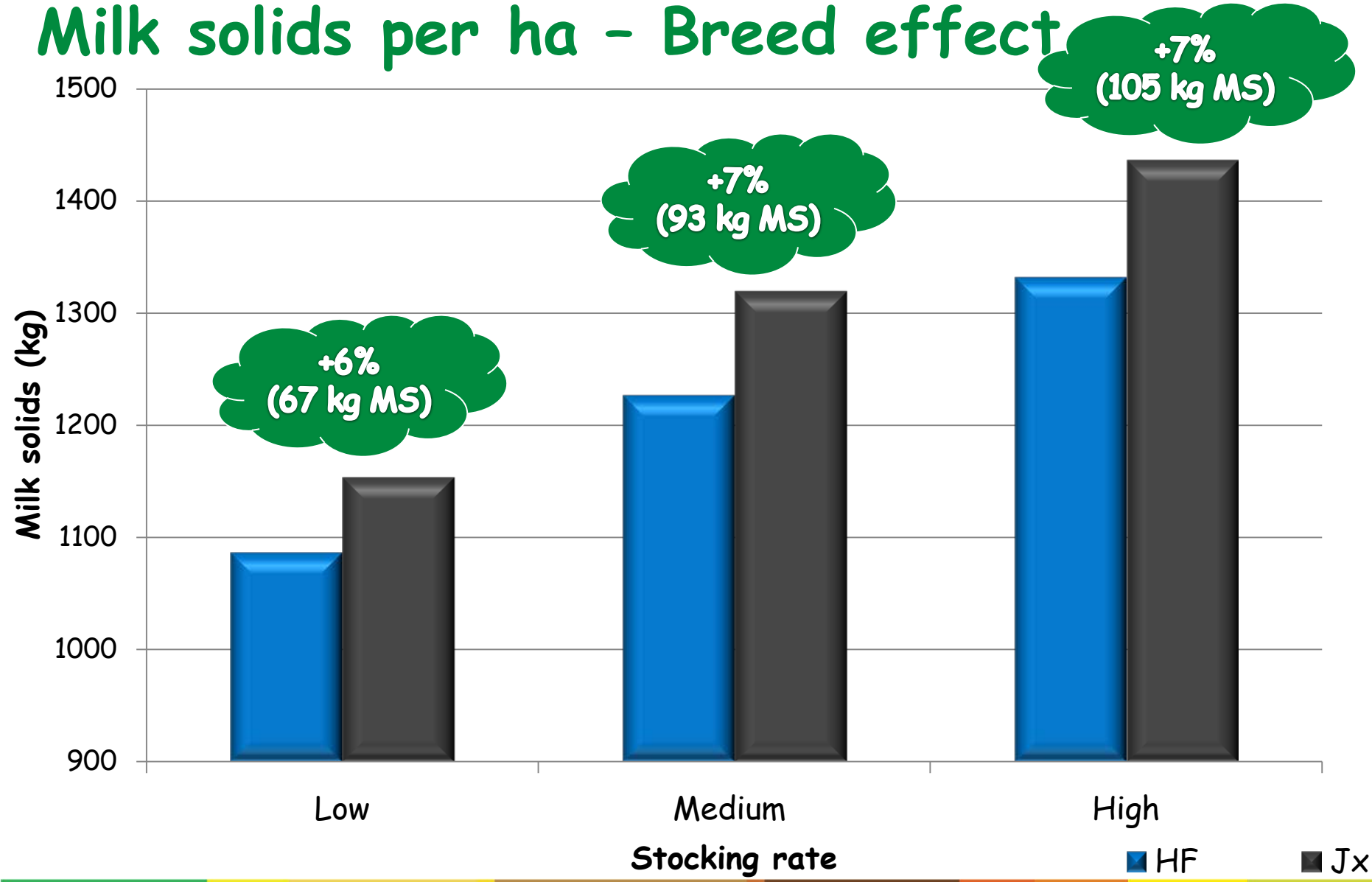
Cumulative milk production (2013-15)

SR	Low		Medium		High		P-Value		
Breed	HF	JX	HF	JX	HF	JX	SR	B	SR*B
Milk yield									
Per cow	5,465	5,066	5,113	4,818	4,947	4,698	***	***	NS
Per ha	13,025	12,684	14,945	14,710	16,353	16,108	***	NS	NS

Milk solids per ha – SR effect



Milk solids per ha – Breed effect



Bodyweight & BCS (2013-15)

SR	Low		Medium		High		P-Value		
Breed	HF	JX	HF	JX	HF	JX	SR	B	SR*B
BW (kg)	523	468	505	464	516	463	NS	***	NS
BCS	2.96	2.94	2.92	2.92	2.89	2.91	*	NS	NS

Bodyweight & BCS (2013-15)

SR	Low		Medium		High		P-Value		
Breed	HF	JX	HF	JX	HF	JX	SR	B	SR*B
BW (kg)	523	468	505	464	516	463	NS	***	NS
BCS	2.96	2.94	2.92	2.92	2.89	2.91	*	NS	NS

Conclusion

- ↑ SR
  - ↑ grazing intensity, ↑ grass utilisation
  - ↓ DHA, ↓ DHR
  - ↓ milk production per cow, ↑ milk production per ha
  - ↓ BCS

- Breed effects (equal maintenance)
  - HF cows heavier
  - HF higher milk yield per cow
  - Jx higher MS yield per ha