

# Performance of Suffolk and Texel sheep grazing pastures that presented contrasting levels of parasite challenge

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# Background

## Breed & FEC (eggs/g)

Age	Suffolk	Texel	Signif.
Lambs: 4 mo.	735	297	***
6 mo.	1253	227	***
7 mo.	942	238	***
Ewes: 2-tooth	601	147	***
4-tooth	122	20	***
Rams:	544	163	P<0.1

Hanrahan & Crowley (1999); Good et al. (2006)

# Objective

Determine whether the major difference in FEC between Suffolk & Texel breeds is reflected in a difference in resistance to the effects of GI parasites on animal performance

# Experimental design

- Purebred flocks of **Suffolk & Texel** sheep maintained at Teagasc, Athenry
- Lambing in early March
- Assigned to graze pastures that presented contrasting levels of parasite challenge:  
    **LOW** = Clean  
    **HIGH** = Dirty
- Replicated over 2 years and involved 294 lambs reared to 18 weeks

# Pastures

- **CLEAN:** a new reseed not previously grazed by sheep used in year 1; same pasture used again in year 2
- **DIRTY:** permanent pasture grazed only by sheep for at least 10 years; used both years

# Animals

- Ewes assigned to pasture type at random, within breed and expected lambing date
- All ewes had been housed from December and were treated with moxidectin at turnout
- All lambs received anthelmintic at 5 weeks for control of *Nematodirus*
- No further anthelmintic treatment until 18 weeks of age
- Lambs were weaned at 14 weeks of age

# Measurements

- **Lambs:**

- Weighed at birth and at  
5, 10, 14 & 18 weeks of age  
FEC at 14 & 18 weeks

- **Ewes:**

- Weighed at 5 weeks post lambing  
& at weaning

- Condition score at lambing,  
5 weeks post lambing  
& at weaning

- **Pasture:**

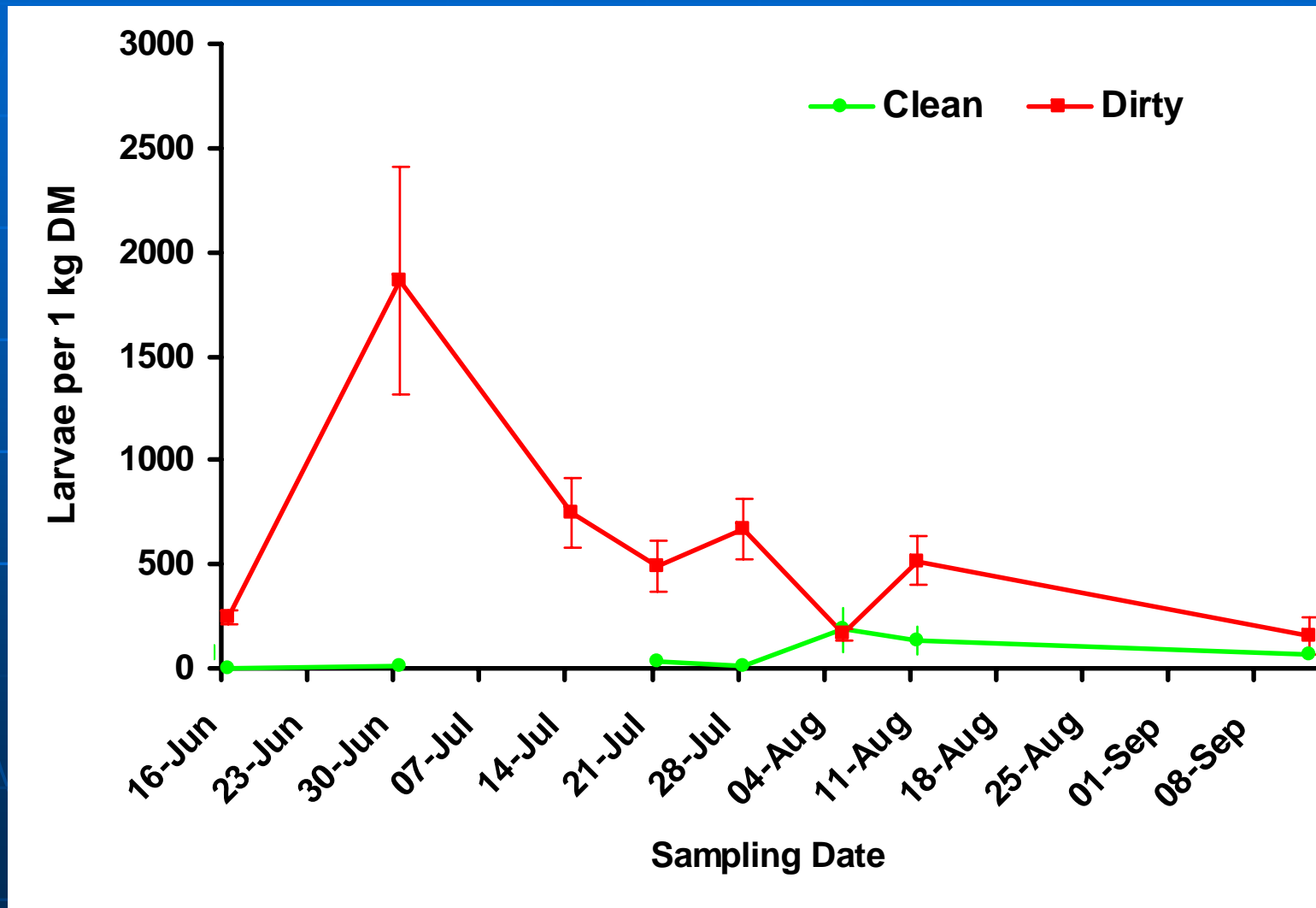
- Larval counts on herbage between  
mid June and mid August of year 1

# Data analysis

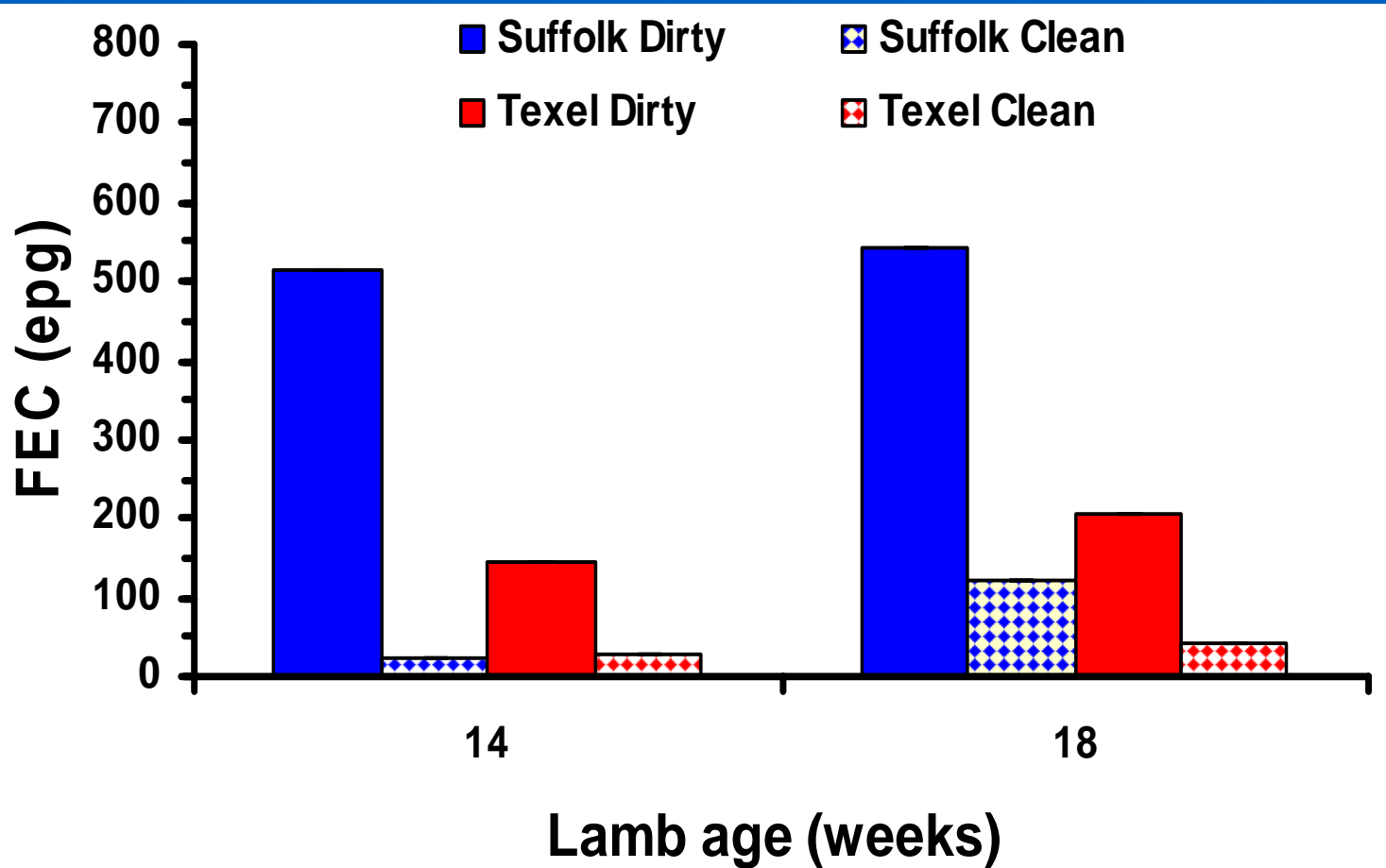
- Used Mixed model procedures of SAS with dam as random effect for lamb growth traits and fixed effects for: -
  - breed, pasture, year,
  - dam age, sex,
  - rearing-type
  - breed\*pasture**

# Results

# Herbage larval counts



# Faecal egg count (FEC) - Lambs -



# Lamb live weight (kg)

Breed	Pasture	Weight at		
		5 weeks	14 weeks	18 weeks
<b>Texel</b>	<b>Clean</b>	17.2	34.6	39.6
	<b>Dirty</b>	16.5	34.3	38.6
<b>Suffolk</b>	<b>Clean</b>	16.2	36.7	41.7
	<b>Dirty</b>	15.7	34.5	37.1
s.e.		0.37	0.47	0.51
Breed x Pasture Interaction		P=0.9	*	***

# Ewe live weight at weaning (kg)

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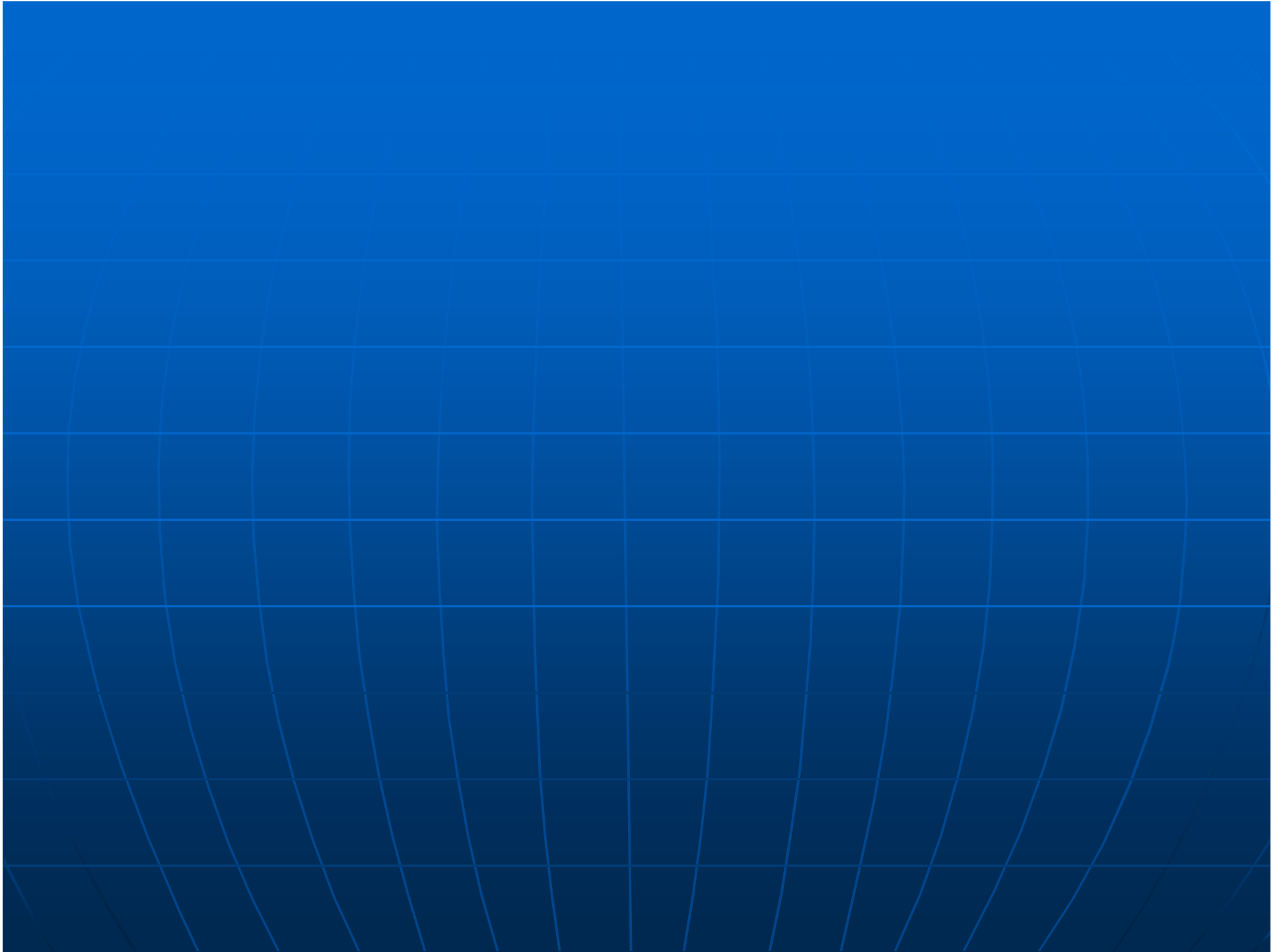
Breed	Pasture	Weight
<b>Texel</b>	<b>Clean</b>	76.7 ± 0.98
	<b>Dirty</b>	76.3 ± 0.96
<b>Suffolk</b>	<b>Clean</b>	83.0 ± 0.96
	<b>Dirty</b>	78.3 ± 0.99

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Breed × Pasture Interaction:  $P < 0.05$

# Conclusions

- Genotype x environment interaction evident for lamb growth
- The effect of exposure to significant parasite challenge was much greater for Suffolk lambs -- 3.6 kg greater at 18 weeks of age
- The differential effect increased as the season progressed
- Similar effects on ewe weight at weaning



# Lamb growth rate (g/day)

Breed	Pasture	Growth rate for weeks		
		0 to 5	5 to 14	14 to 18
<b>Texel</b>	<b>Clean</b>	346	302	149
	<b>Dirty</b>	324	271	129
<b>Suffolk</b>	<b>Clean</b>	323	332	140
	<b>Dirty</b>	306	268	91
<b>s.e.</b>		<b>8.5</b>	<b>7.3</b>	<b>10.1</b>
<b>Breed × Pasture Interaction</b>		<b>P = 0.8</b>	<b>*</b>	<b>P = 0.1</b>

# Background

- Anthelmintic resistance in gastro-intestinal (GI) nematode populations – sustainability?
- Genetic variation among sheep for resistance to GI nematode infection  
including
- Large differences among breeds in resistance as measured by standard faecal egg count (FEC)