Smarter

SMAll RuminanTs breeding for Efficiency and Resilience

Differences in growth between Corriedale sheep divergent lines for resistance to nematodes

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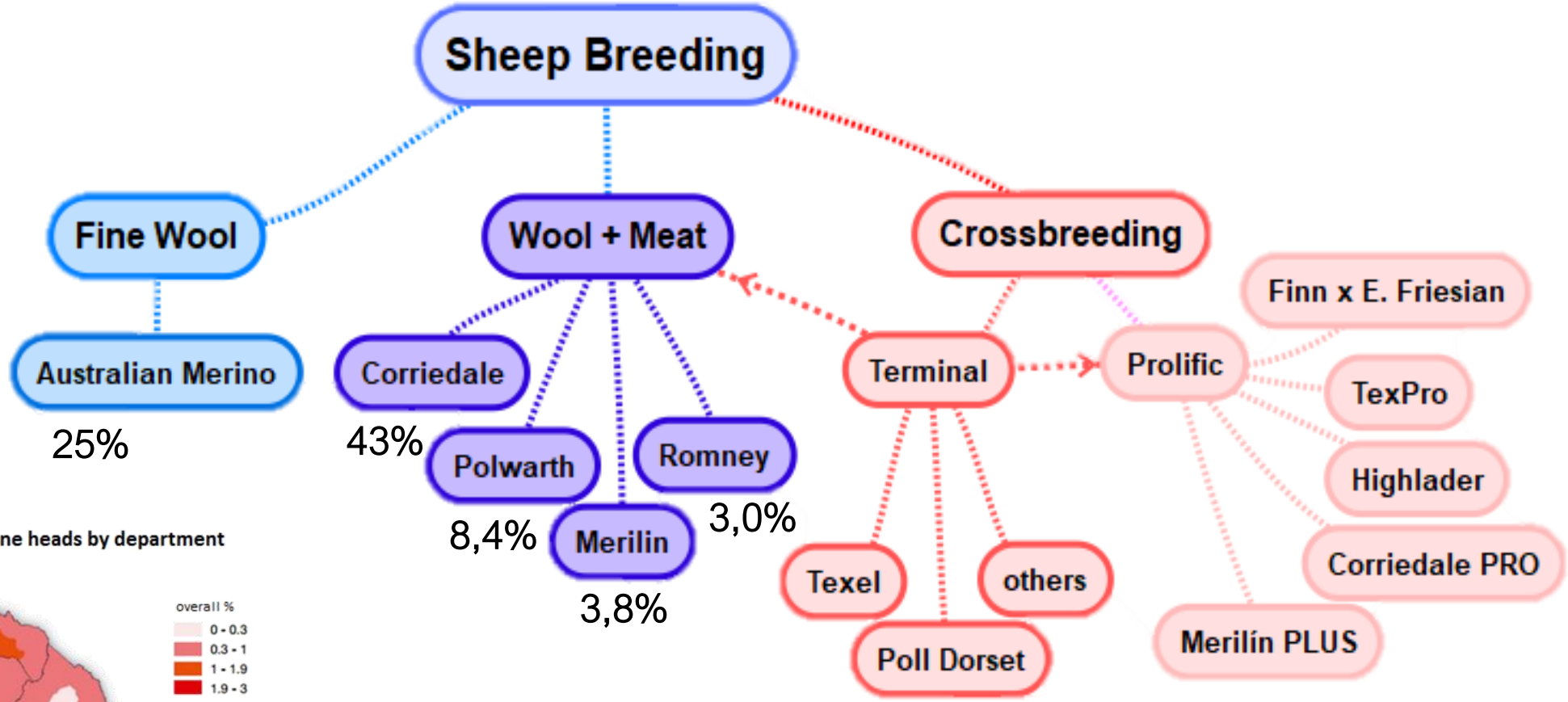
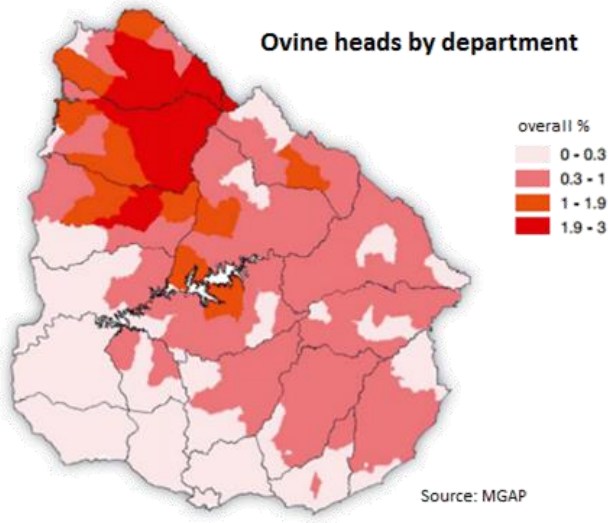
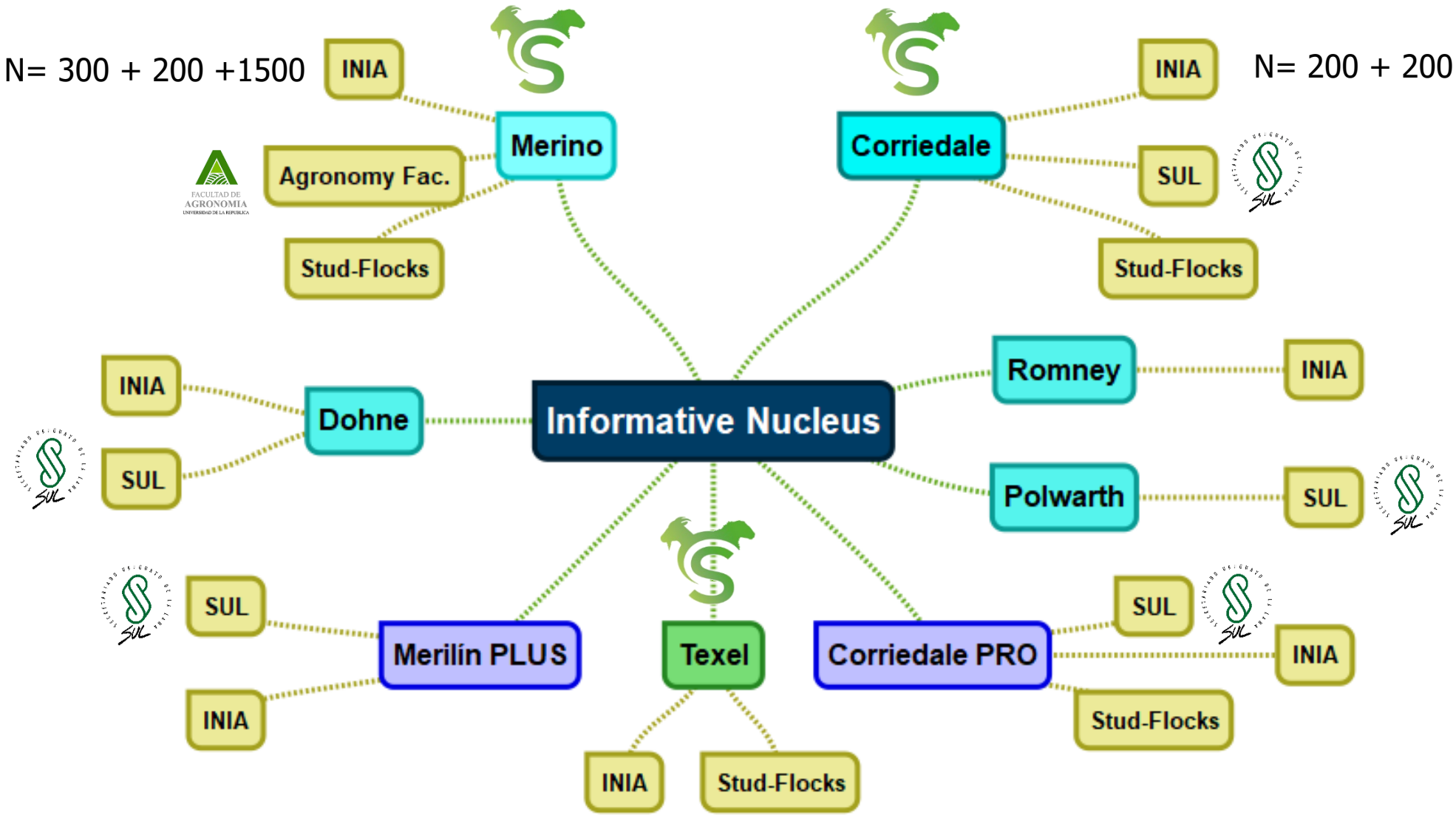
Introduction: Sheep breeding in Uruguay





Informative Nucleus



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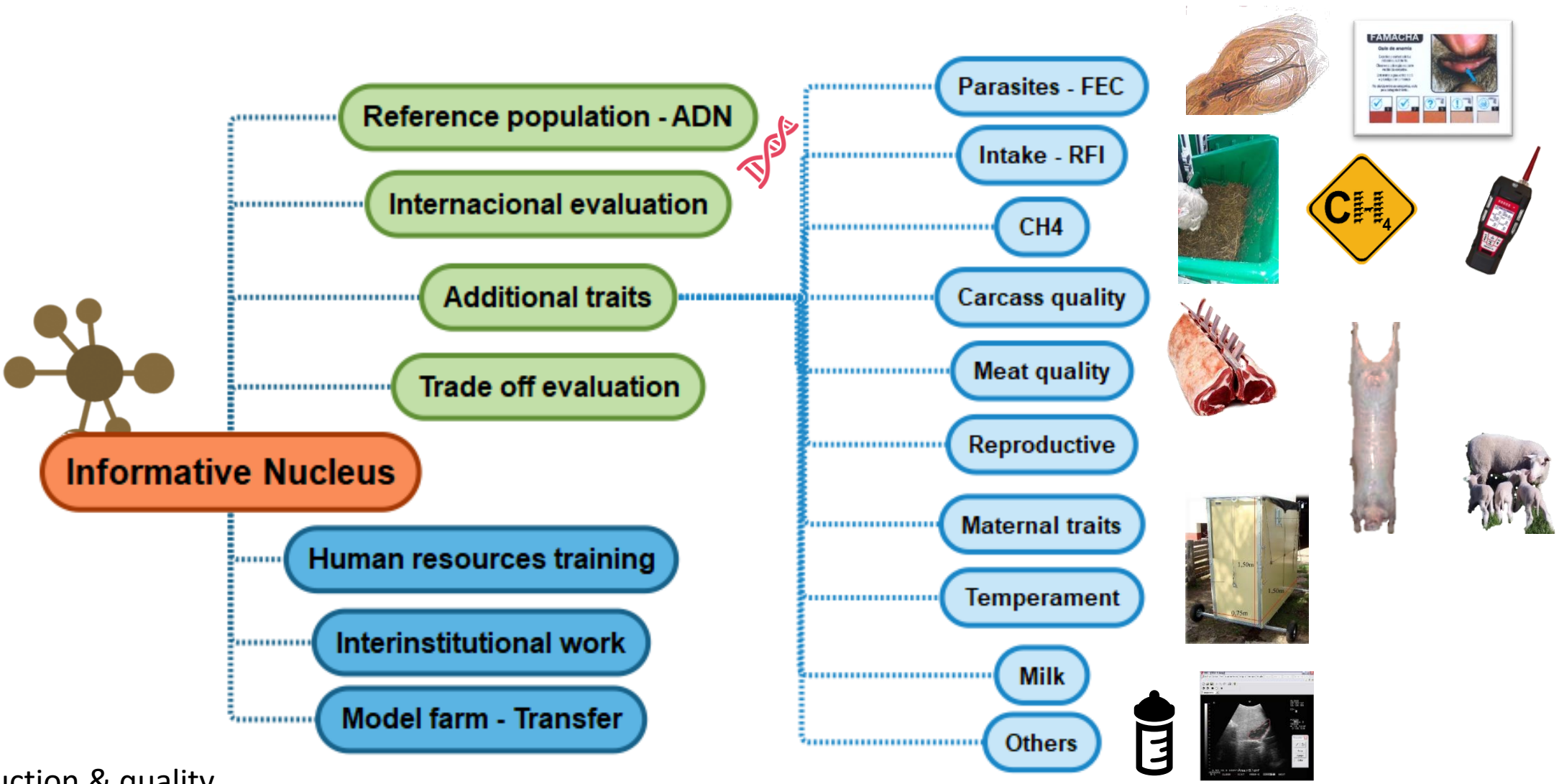
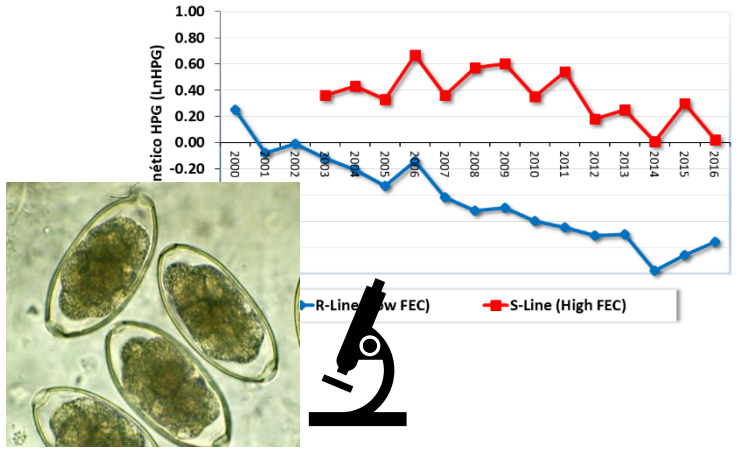
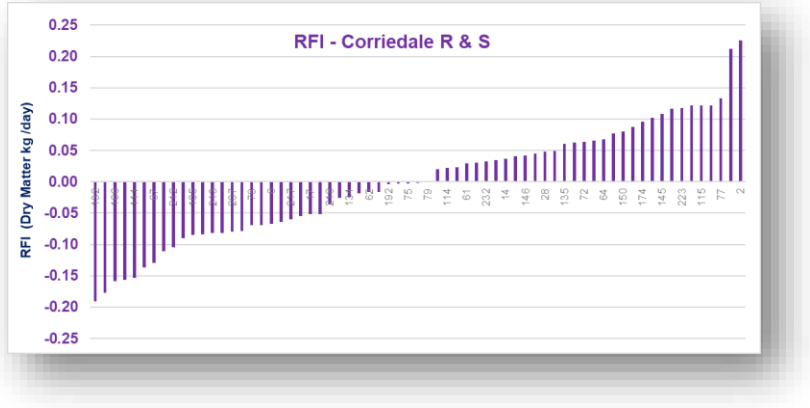


- ✓ **Wool** production & quality
- ✓ **Growth**: birth, weaning, post-w, shearing
- ✓ **Reproduction**: Twinning rate

The question to answer

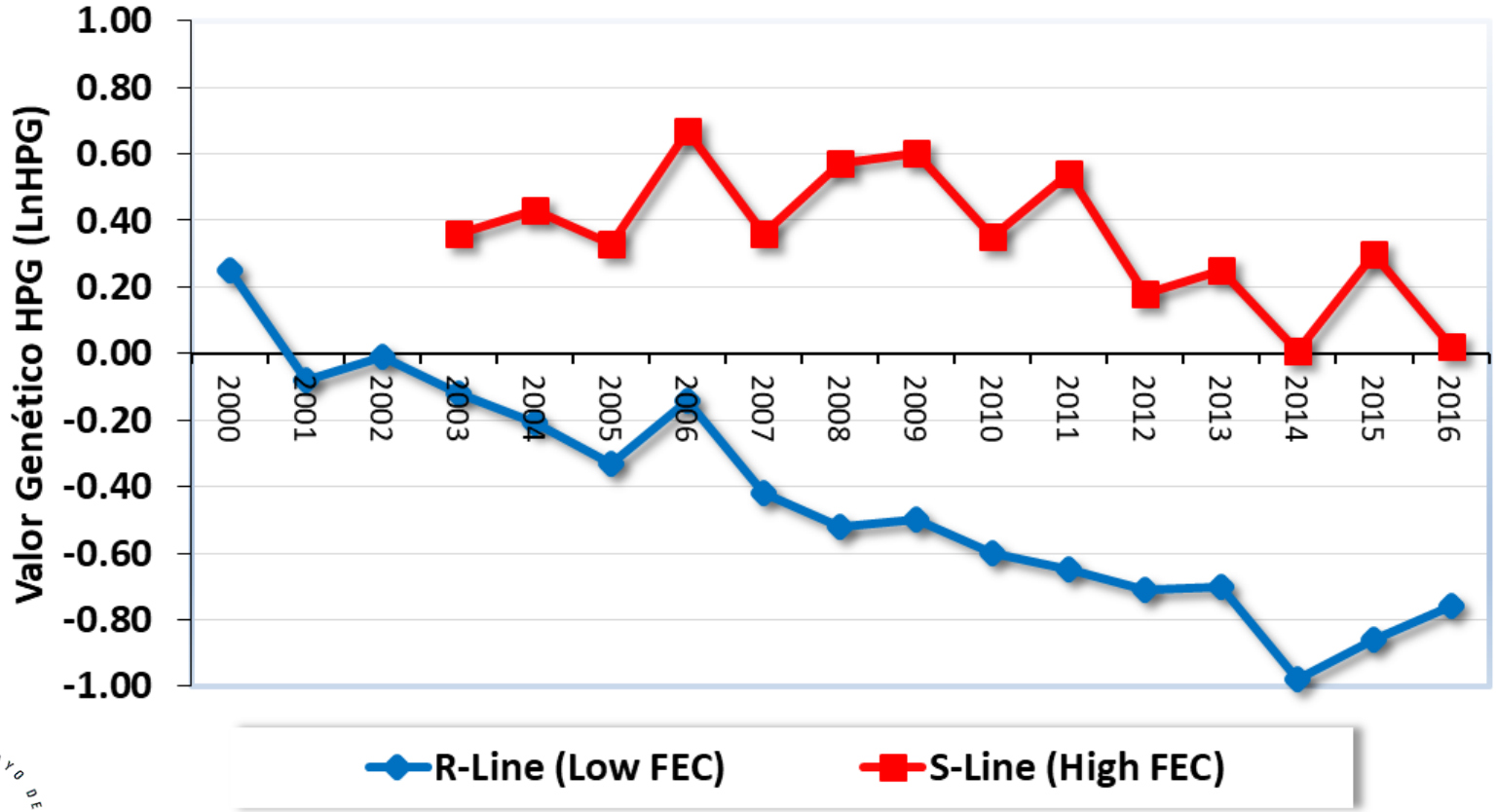
How **divergent selection lines** for resistance to PGI would respond (growth/intake/RFI) in contrasting environments?

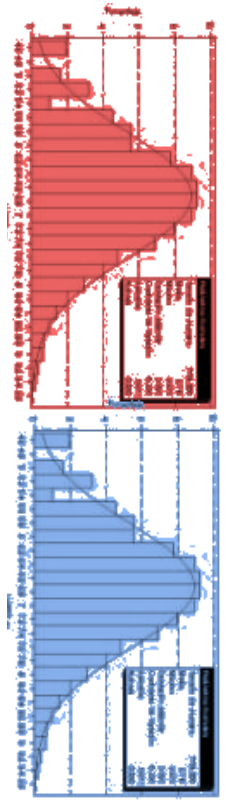




Material & Methods

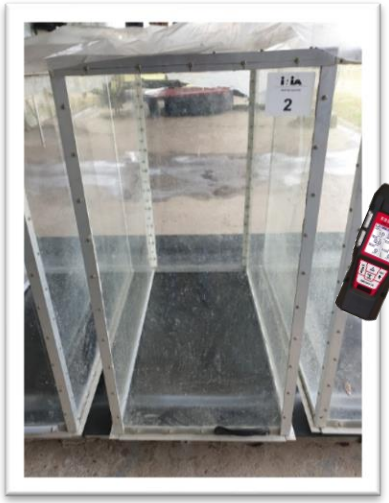
- 64 Corriedale lambs from **divergent lines for resistance** to GIP were used
  - 27 resistant (**R**) & 37 susceptible (**S**) lambs (M-F, 340 days-old)





Lower faecal egg count

✓ **Trade-off:** Feed intake - RFI vs parasite resistance



Project: RUMIAR + SMARTER

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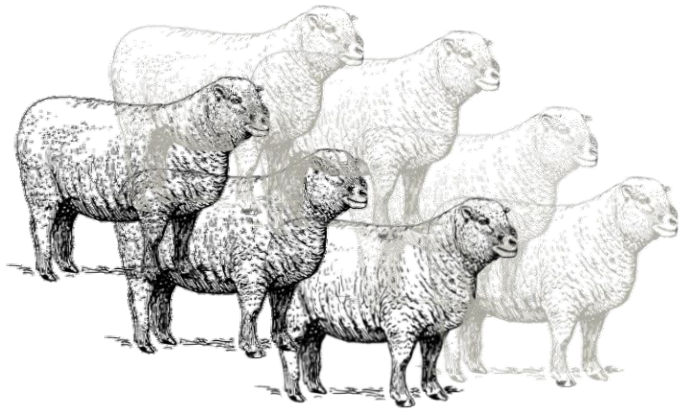


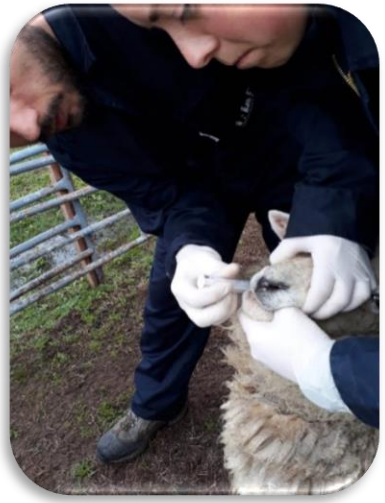
- Stratified by sex, body weight, and sire
- Total period divided into 2 parts:

Part 1. Worm-free animals	**44 days**

- Diet and water *ad libitum*
- Lucerne silage

DM	CP	ME
36.5%	21.7%	2.51%

Part 2. Artificial infestation of *Haemonchus contortus* **42 days**



- Splitted into two subperiods from **0-23** and **24-42** days post infestation
  - **P2a** and **P2b**

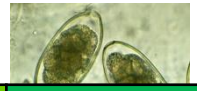
- The infestation occurred in three consecutive days with 2,000 L3 larvae per day

- Records for **FEC** were taken in days **9**, **23**, **27**, **30**, **37** & **42** post infestation
- The **DMI** (kg/day) was computed as the average of the individual daily intake
- The average daily gain **ADG** (kg/day) was calculated by regression using all weights for each period
- **RFI** is the residuals resulting from the model

DMI = ADG + metabolic weight + AOD + pen(sex) + e

MW= mid-weight for each period ^0.75) Alternative models: Effects (Type of birth, Fat Depth); GMD (e.g. windows 3 day)

Results



24 - 42 days post infestation

Traits	Part 1	Part 2	2.1	2.2
Feed Intake	R=S	R=S	R=S	R=S
RFI	R=S	R=S	R=S	R=S
Growth (ADG)	R<S	**R>S**	R>S	R>>S
Feed Conversion Ratio (FI/ADG)	R=S	**R<S**	R=S	R<S
REA	**R>S**	R=S		
Fat depth	R=S	R=S		

Line	FEC 23 d	FCR
Resistant	1049	7.99±0.63
Susceptible	2479	10.56±0.72

Line	ADG1 (kg/day)	ADG2 (kg/day)	ADG2.1 (kg/day)	ADG2.2 (kg/day)
Resistant	0.123 ±0.009	0.143 ±0.008	0.142 ±0.008	0.162 ±0.011
Susceptible	0.131 ±0.011	0.117 ±0.009	0.129 ±0.009	0.122 ±0.012

$p<0.05$

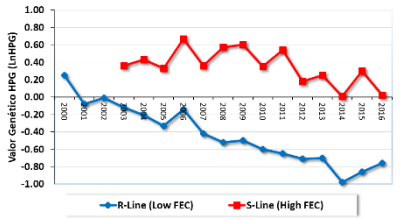
Table 1
A possible ordering of the priorities (1 highest to 4 lowest) given by a growing or a reproducing animal to its various body functions when partitioning a scarce food resource[a]

Growing animal		Reproducing animal
Acquisition phase	Expression phase	
1. Maintenance of body protein[b]	1. Maintenance of body protein[b]	1. Maintenance of body protein[b]
2. *Acquisition of immunity*	2. Protein gain	2. Reproductive effort (pregnancy/ lactation)
3. Protein gain	3. *Expression of immunity*	3. *Expression of immunity*
4. Maintenance and gain of body lipid	4. Maintenance and gain of body lipid	4. Attainment of desired fatness

[a] For a naive, growing animal without any prior experience to a challenge the phase of acquisition of immunity is considered separately from that of expression of immunity.
[b] This includes repair, replacement and reaction to damaged or lost tissue.

R.L. Coop, I. Kyriazakis / Veterinary Parasitology 84 (1999) 187–204

Conclusions



- The Resistant line showed higher **ADG** than S line and **lower parasite infestation** and better **Feed Conversion Ratio**

- Probably, the high **CP** diet content and the age of the animals contribute to decreasing the differences in **FEC** between lines (it was higher in previous records)

- These preliminary results suggest a difference in growth pattern between R&S lines during the infestation period without effects on **DMI.**

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Thank you for your attention

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