

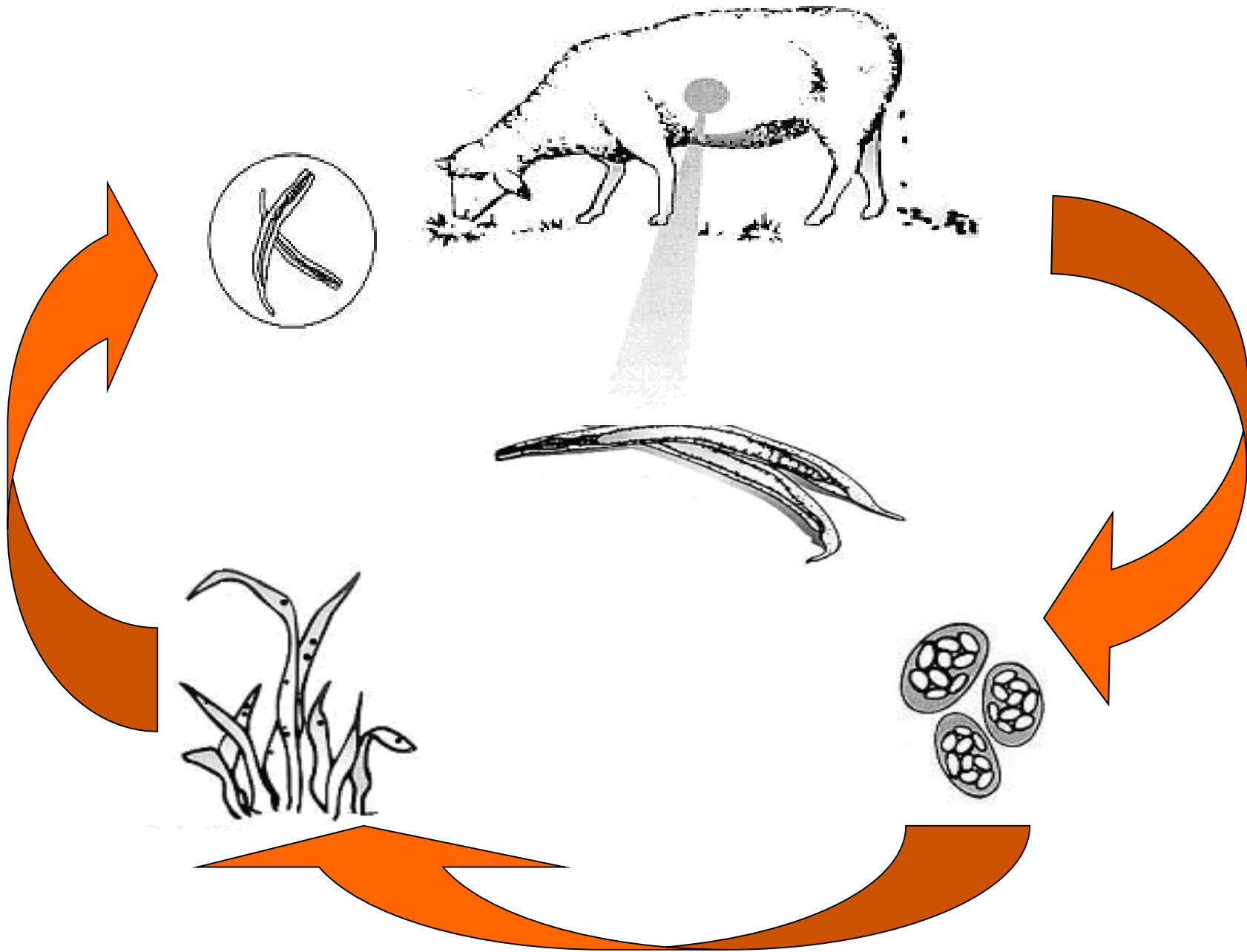
An immunogenetic analysis of host resistance to nematode infection in sheep.

M.J. Stear

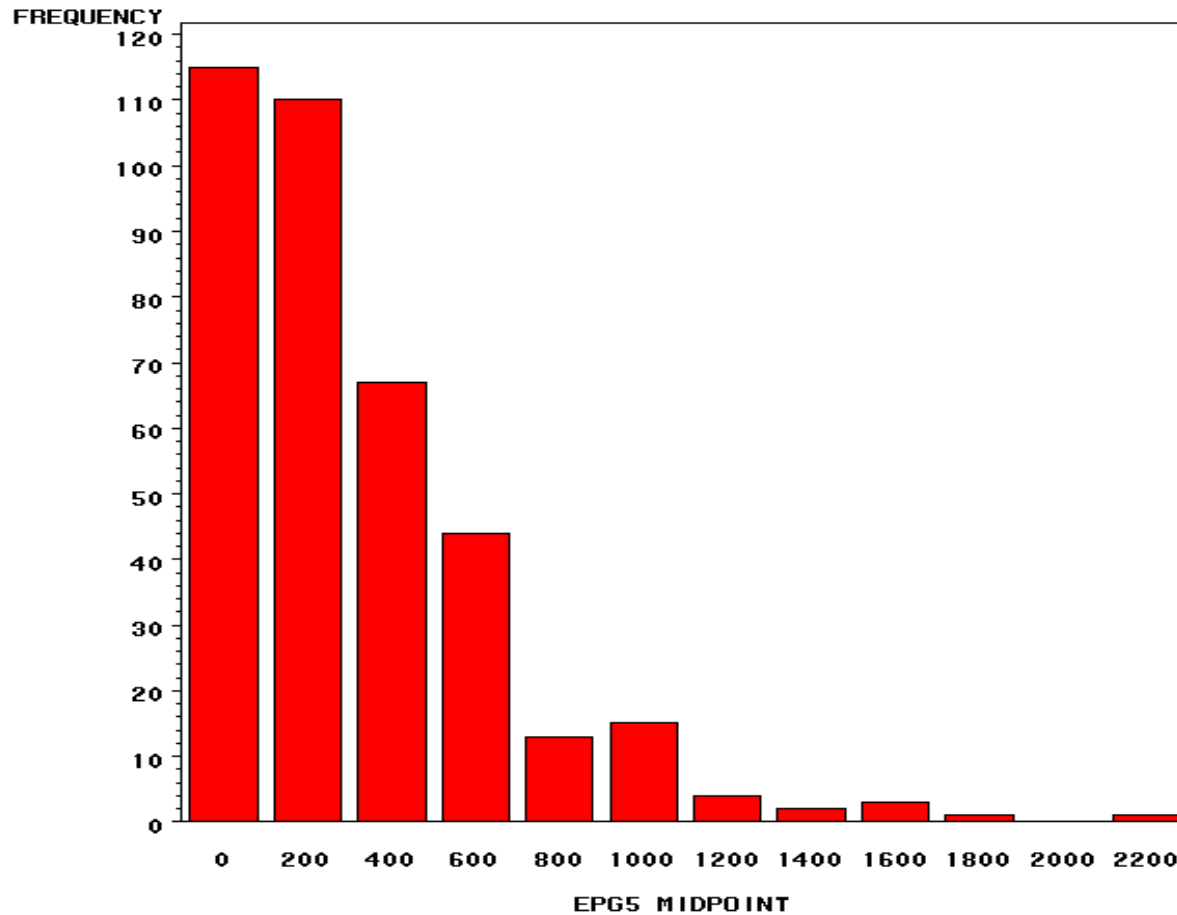
Biodiversity, Animal Health and
Comparative Medicine

Aims

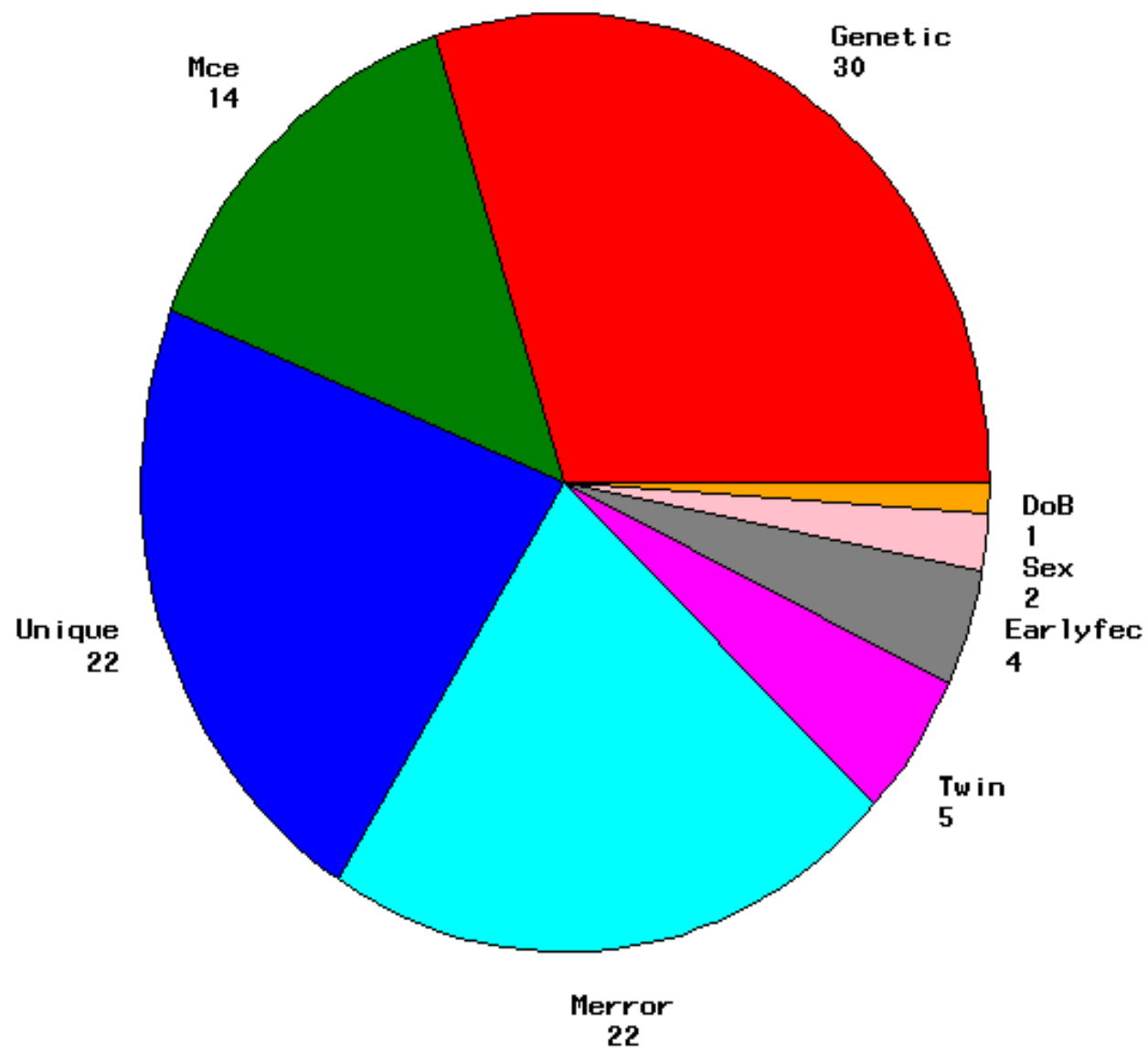
- Describe immune response to *T. circumcincta*
- Consequences for markers of resistance



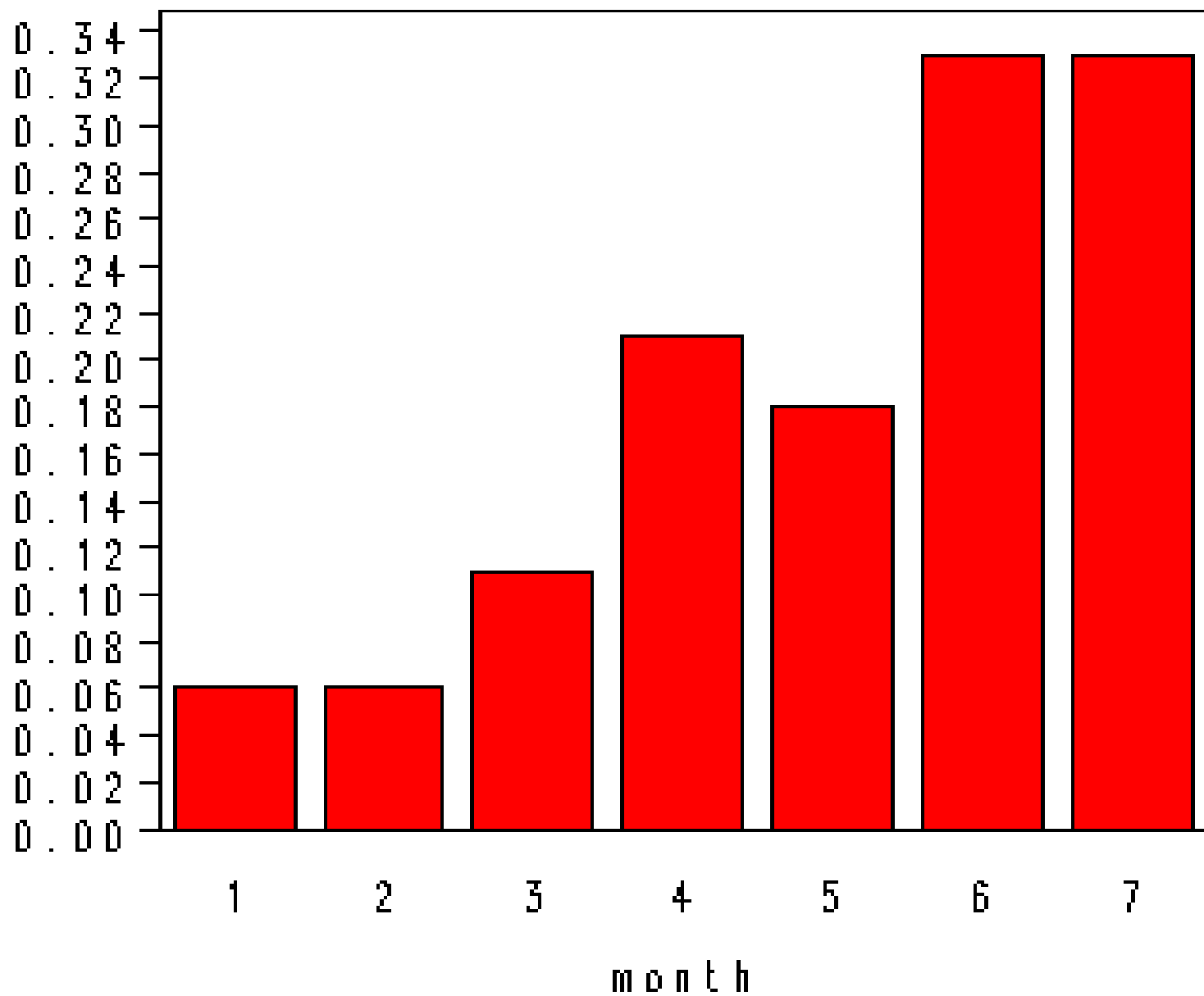
Variation among lambs in FEC



Sources of Variation in FEC



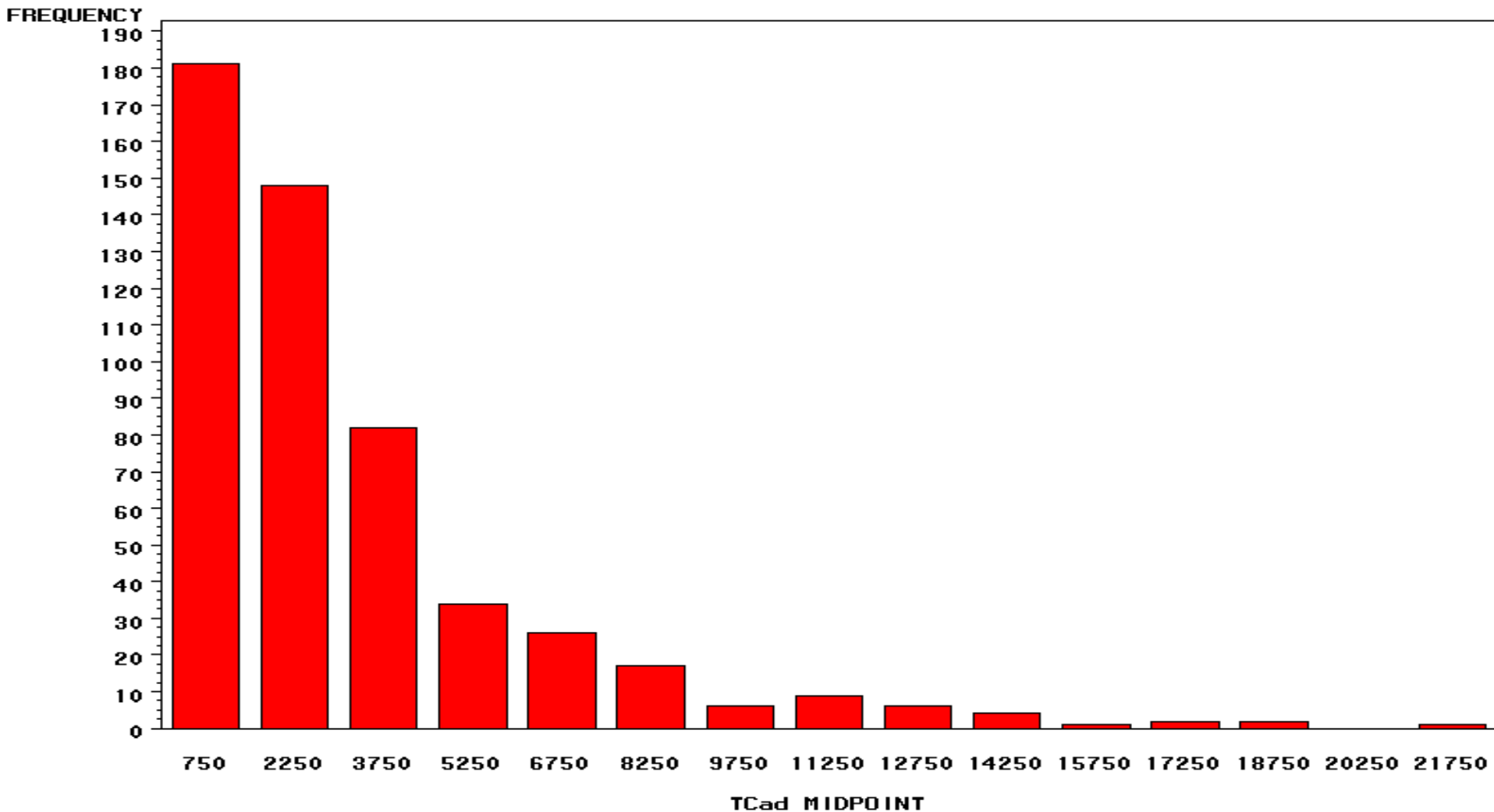
Heritability of EPG



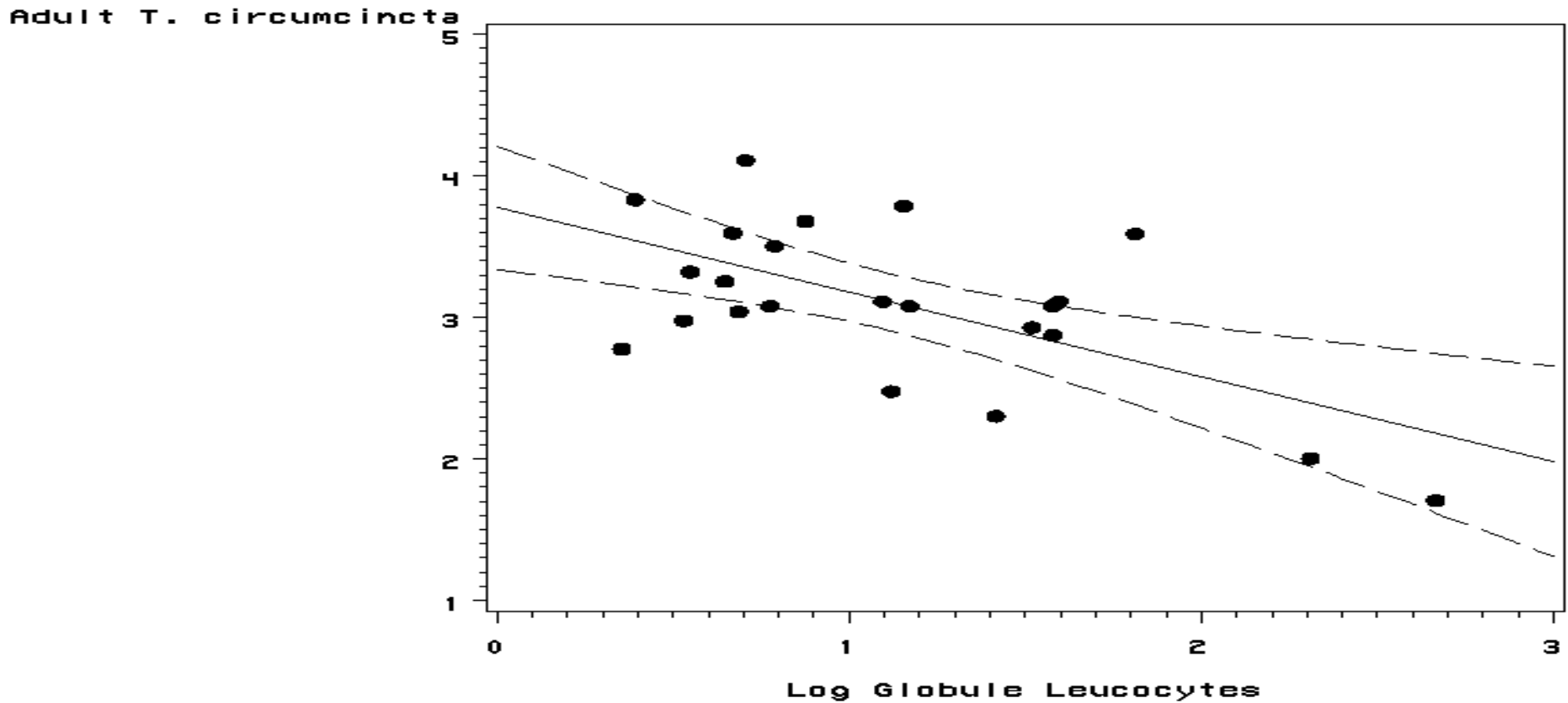
Mechanisms underlying Variation in FEC

- Faecal volume
- Parasite fecundity
- Parasite number

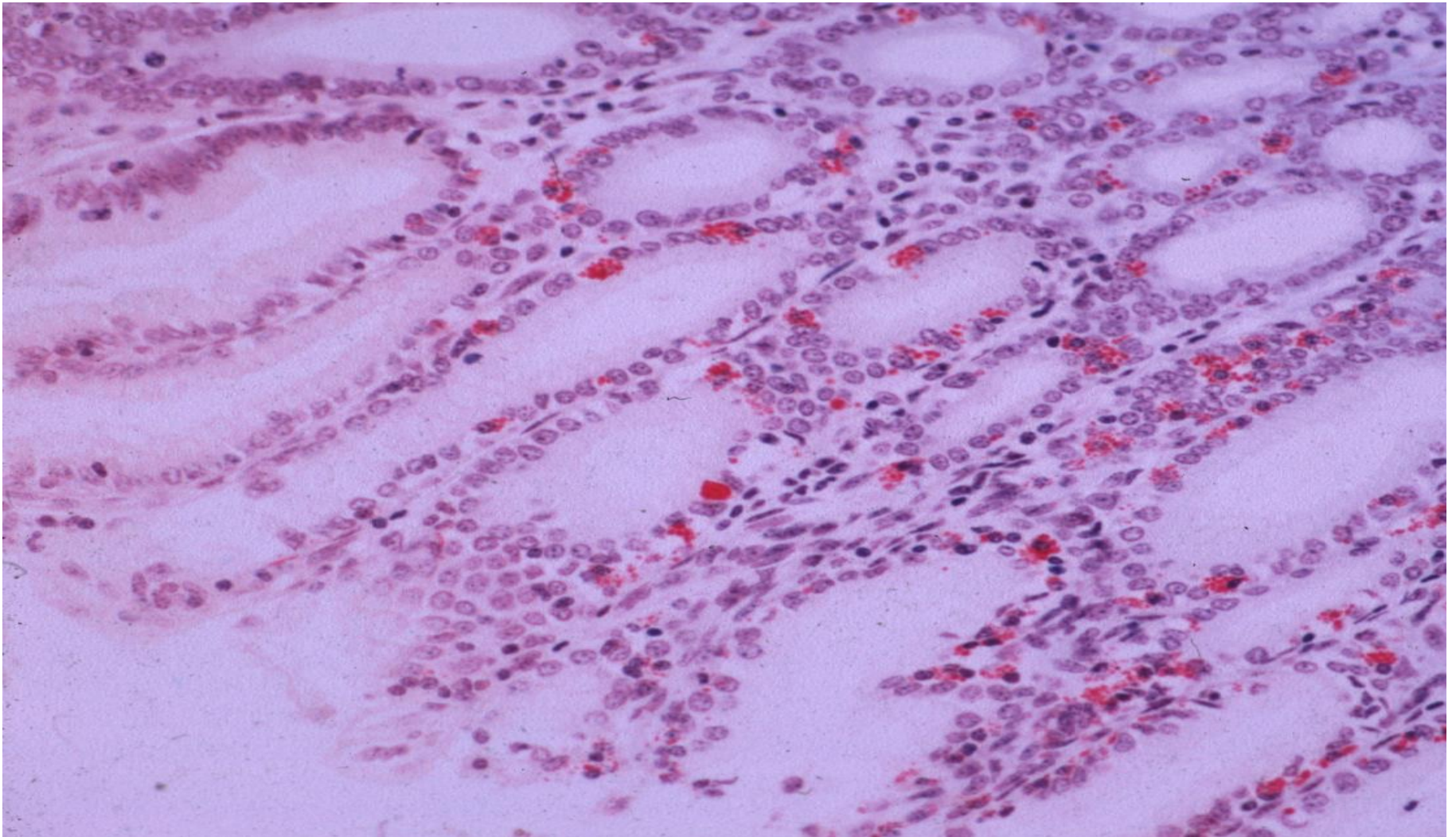
Distribution of parasites in lambs



Immediate hypersensitivity and decreased worm numbers

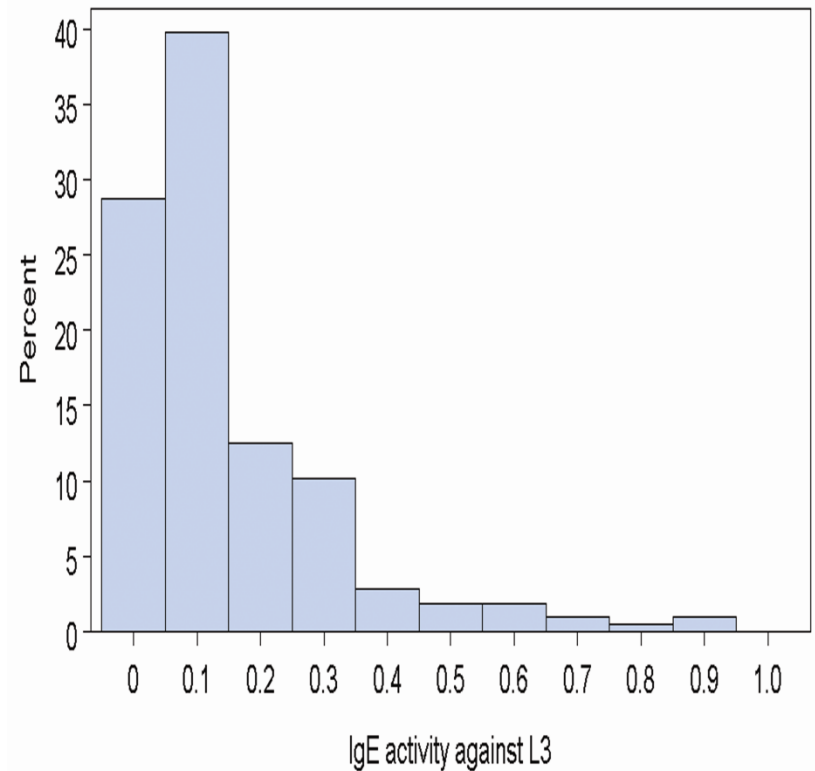


Globule leukocytes in the abomasum

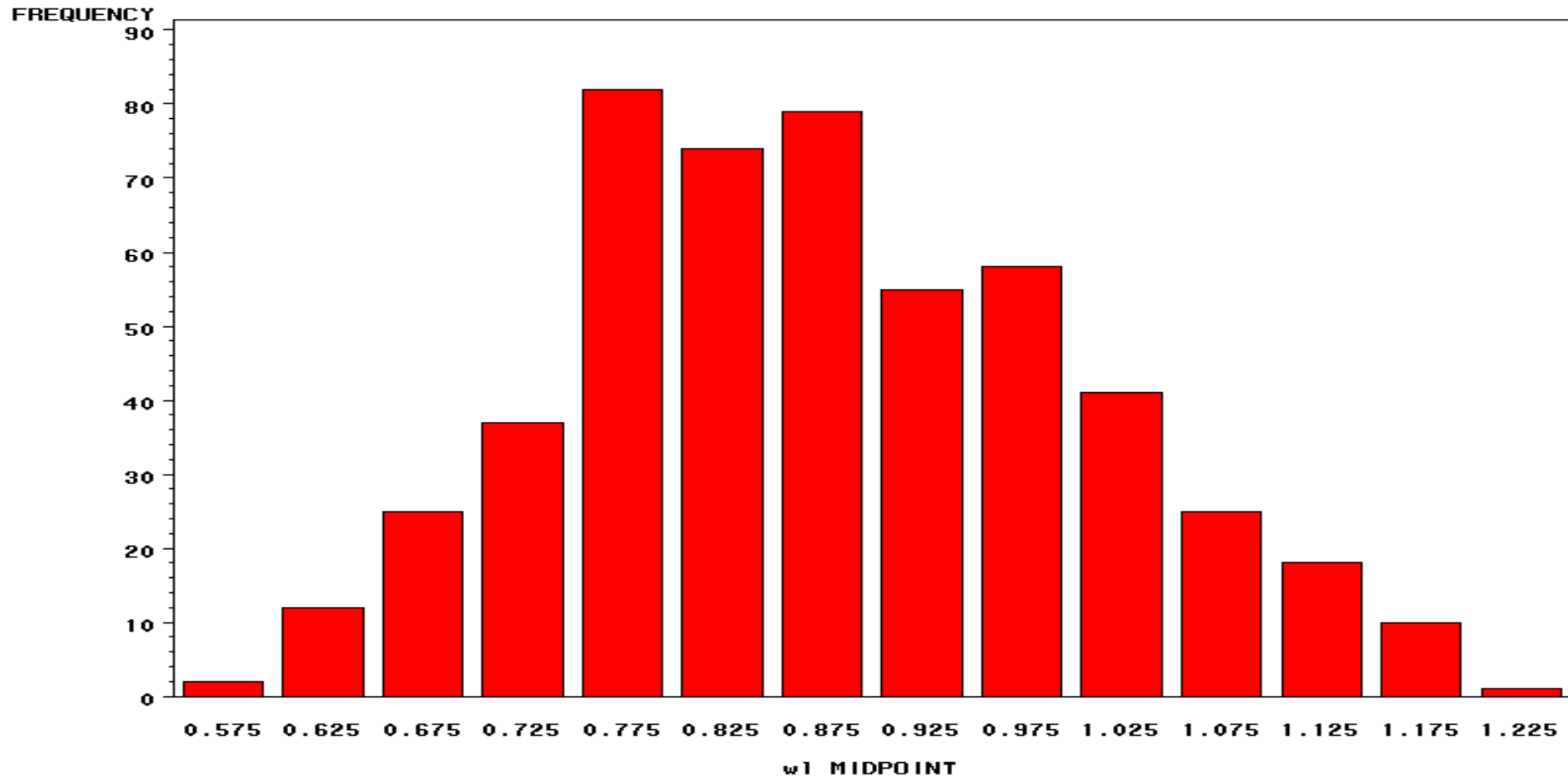


IgE

- Response to L3
- Overdispersed
- $h^2 = 0.39$ (0.16)
- Associated with decreased growth

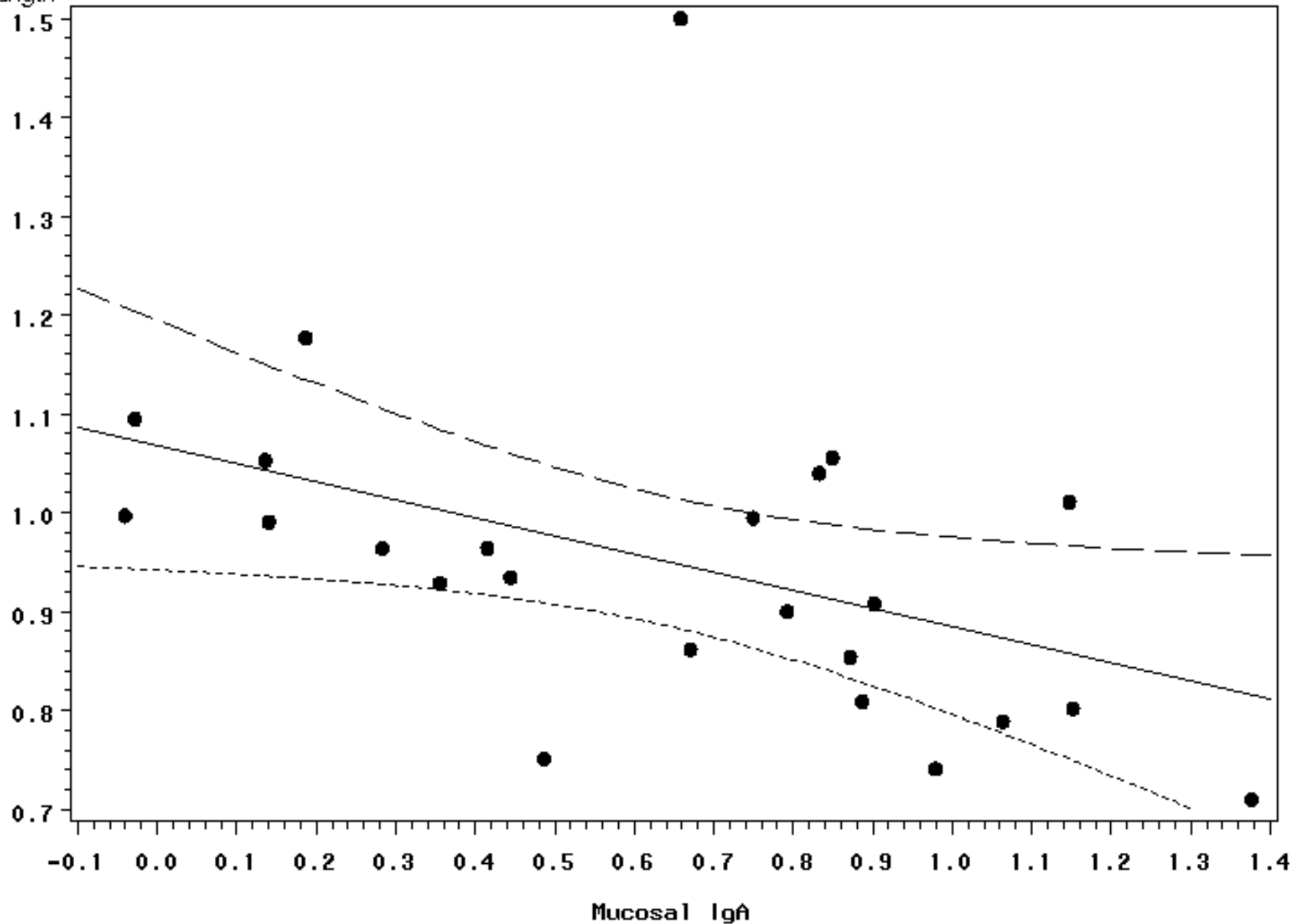


Distribution of worm length



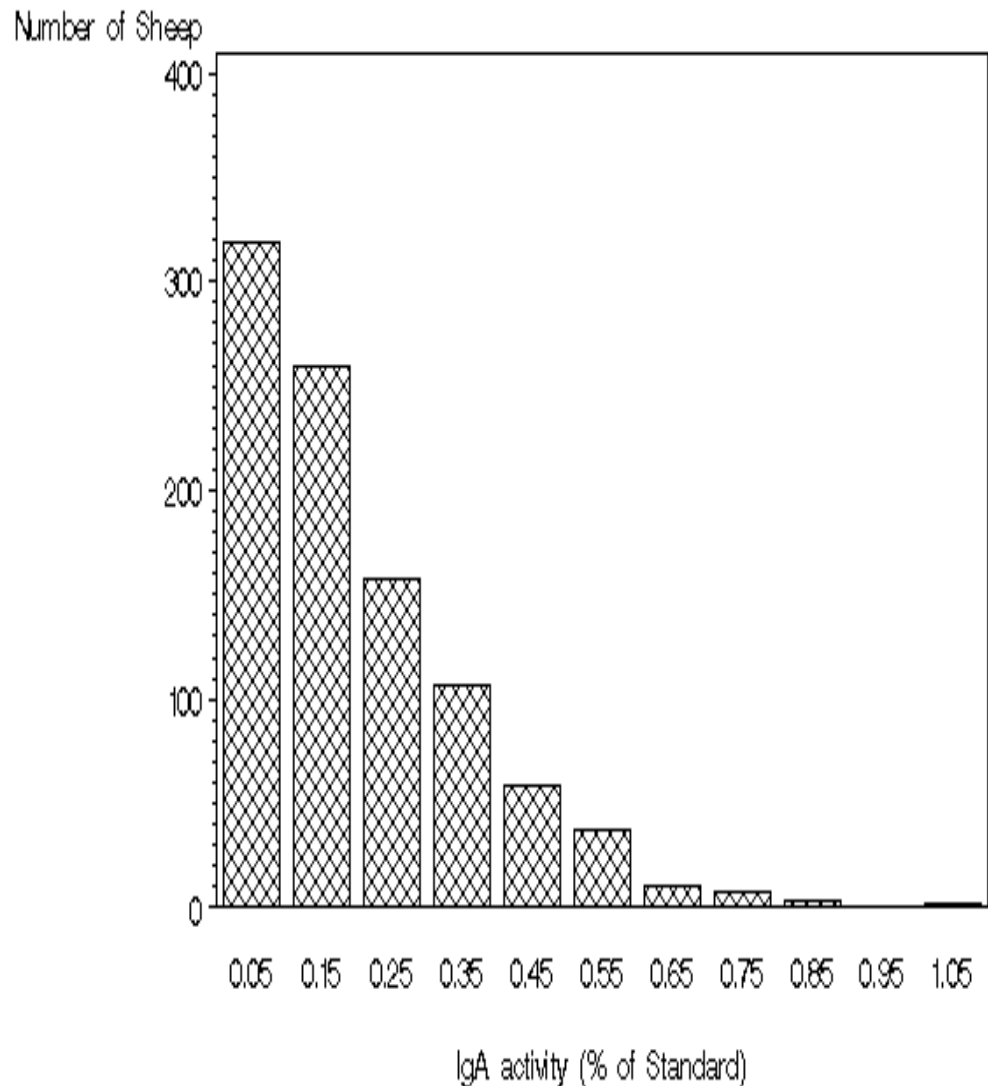
Mucosal IgA and Worm Length

Worm Length



IgA activity

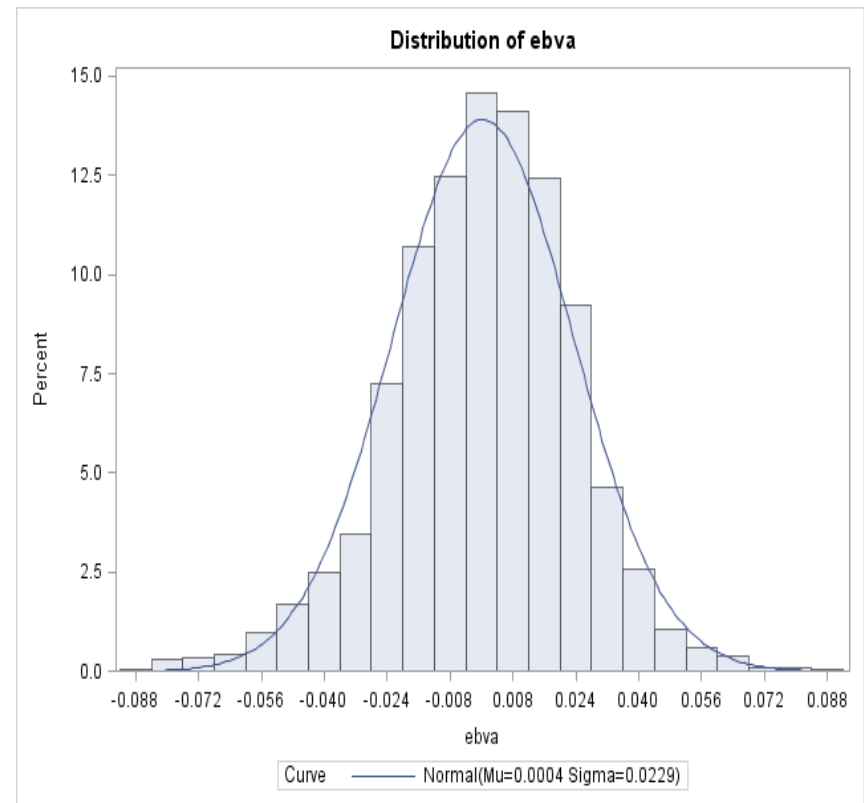
- L4
- Gamma distribution
- $h^2 = 0.56$ (0.11)
- Associated with increased growth



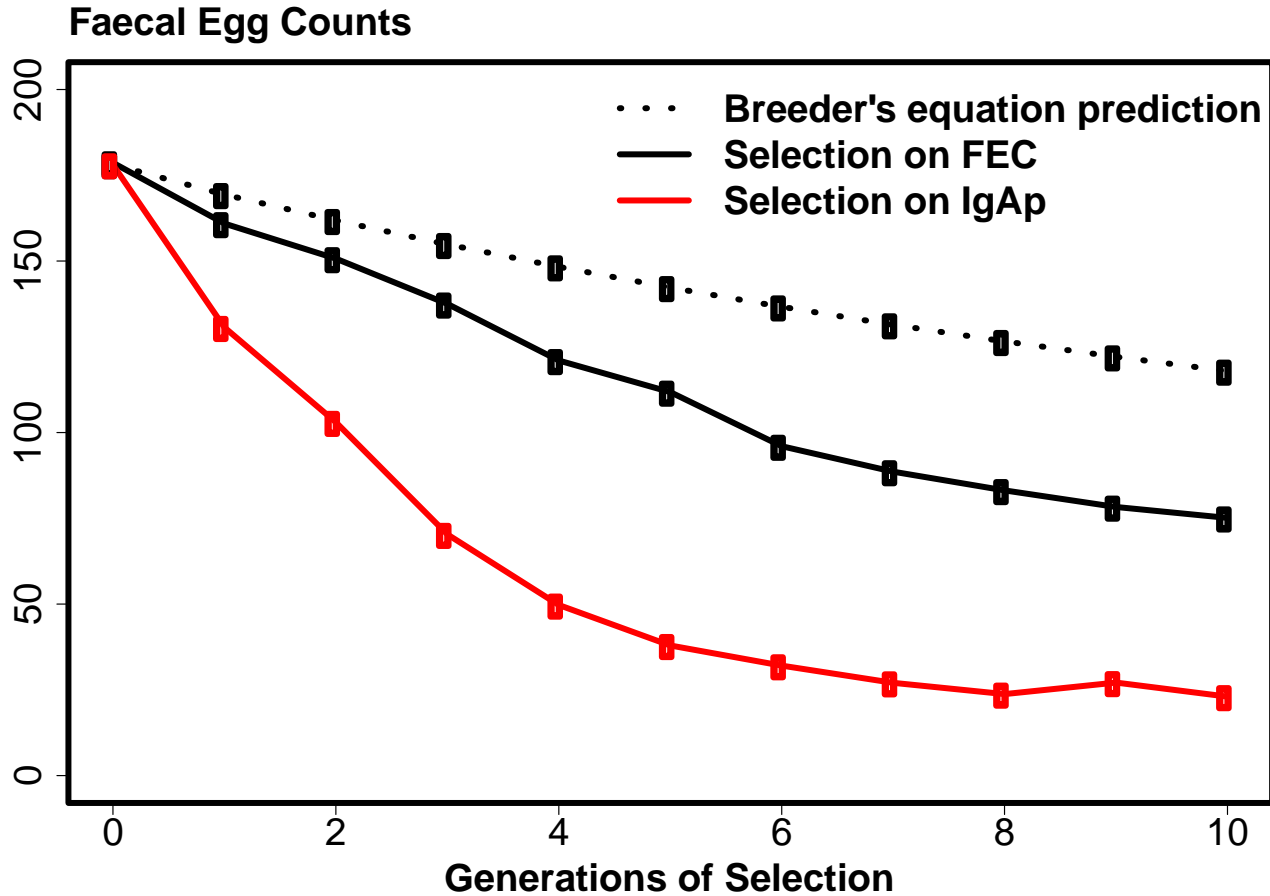
Saliva IgA

EBV

- 2600 Lleyn lambs
 - 8634 ancestors
 - Box-Cox IgA
- Heritability 0.35 ± 0.07
- Rg LogFEC -0.56 ± 0.10
- Muscle depth $r_p = +0.15$
- LogNematodirus $r_p = -0.12$



Response to Selection



Summary

- Resistance to nematode infection
 - Strong genetic influence
 - Two major mechanisms
 - IgA decreased worm size increased sheep growth
 - IgE decreased worm number decreased growth

Acknowledgements

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