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Factors Affecting the Incidence of Gastrointestinal Nematode Infection in Sheep

Produced for the CRC for Premium Quality Wool undergraduate program by;
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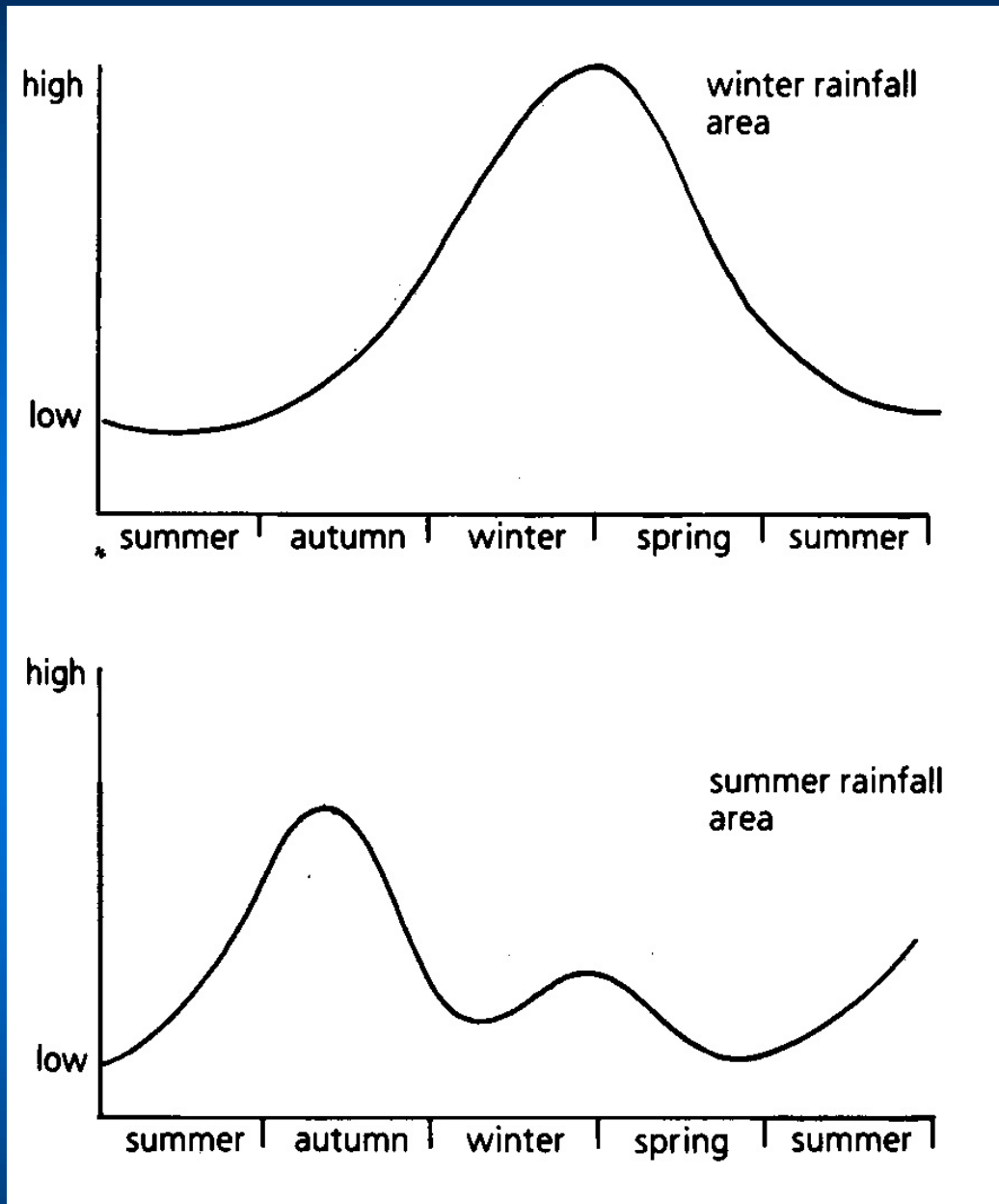
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Typical larval distribution patterns on Australian sheep pastures in the winter and summer rainfall zones

Steve Walkden-Brown
Source: Brightling, A. (1994)



Prevalence of common gastrointestinal nematodes of sheep

Parasite	Rainfall zone	
	Summer	Winter
<i>Haemonchus contortus</i>	+++	+
<i>Ostertagia</i> sp.	++	+++
<i>Trichostrongylus</i> spp.	+++	+++
<i>Nematodirus</i> spp.	++	++
<i>Oesophagostomum columbianum</i>	++	-
<i>Oes. venulosum</i>	+	+++
<i>Chabertia ovina</i>	+	+++

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Steve Walkden-Brown
Source: Cole, V.G. (1986)



Parasite factors

- **Egg production**

- *Haemonchus*: 5,000 -10,000 eggs/day
- *Trichostrongylus* & *Ostertagia*: 100-200 eggs/day
- *Nematodirus*: 50 eggs/day
- *Oesophagostomum*: 12,000 eggs/day

- **Pathogenicity of adult worms**

- *Haemonchus* adults are ~ 6-8 x more pathogenic than *Ostertagia*, *Nematodirus*, *Trich.* adults, and T4 larvae

- **Resistance to cold and desiccation**

- *Haemonchus* eggs and larvae are most susceptible to desiccation, *Trichs* and *Nematodirus* most resistant

- **Anthelmintic resistance - HUGE PROBLEM!**

- widespread for levamisole and benzimidazole groups and closantel
- increasing with the macrocyclic lactones

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Host factors

- **Immunity**

- Acquired or “age immunity” influenced by:
 - Worm species - *Haemonchus* induces less immunity
 - Degree of challenge - immunity requires infection
 - Host genotype - EPG in faeces has a $h^2 \sim 0.2-0.4$
 - Physiological state - immunity is “relaxed” during late pregnancy and lactation; this leads to a “peri parturient rise” in faecal egg counts
 - Host nutrition - affects both resistance and resilience
- Hypersensitivity or “Self cure” phenomenon
 - Independent phenomenon - expulsion of worms

- **Stocking rate/grazing management**

- This has profound effects on the level of pasture contamination with eggs and infective T3 larvae

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