**Thesis Abstract & Published Papers**

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<th>Name:</th>
<th>Alem Kidane</th>
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<tr>
<td>Project Title:</td>
<td>PhD: Interactive effects of nutrition and genetic resistance to parasitism on periparturient relaxation of immunity to gastrointestinal nematodes in sheep</td>
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<td>Project No:</td>
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<td>Oct 2006 – Sep 2009</td>
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**Abstract:**

Gastrointestinal nematode parasitism is one of the major causes for reduced performance, compromised health and welfare of grazing ruminants. The extensive, and sometimes inappropriate, use of anthelmintics for gastrointestinal nematode parasite control has led to anthelmintic resistance. The latter has urged the development of alternative approaches that would reduce reliance on anthelmintics (Chapter One). This thesis reports effects of combining such alternative approaches on sheep productivity and parasitism, investigated under both pen (Chapters Two and Three) and grazing (Chapters Four, Five and Six) conditions.

The first two experiments report the effects of periparturient metabolizable protein nutrition of twin-rearing ewes, on the degree of resistance to an abomasal nematode parasite, *Teladorsagia circumcincta*, and performance under varying degree of experimental parasite infection (Chapter Two) and with two breeds that differ in their production potential (Chapter Three). The results suggest that maternal protein supplementation improves litter performance independently of infection pressure and production potential, and reduces nematode egg excretion by ~60% in the more productive breed. However, protein scarcity had only limited effects on resistance to parasites in the less productive breed used.

The last three experimental chapters describe grazing studies where maternal protein supplementation was combined with grazing chicory relative to grass/clover from around weaning (Chapter Four) and early lactation (Chapters Five and Six) to lamb finishing. Maternal protein supplementation and grazing on chicory consistently improved ewe and lamb performance and reduced lamb parasitism in an additive manner. On an initially parasite infested pasture (Chapter Six), maternal protein supplementation and grazing on chicory reduced lamb drench requirement by 31 and 40%, respectively. The grazing experiments strongly suggest that the effects of chicory could be through (1) improved nutrient supply, boosting lamb resilience and/or resistance, (2) reduced larvae intake and (3) direct anthelmintic-like effects. The absence of significant interactive effects between maternal protein nutrition and grazing on chicory suggests that under the grazing conditions used, achieved level of ewe protein intake from the combination was, at least, not more than adequate or the anthelmintic-like property of chicory was subtle. Exploitation of the effects of combination from the above alternative approaches should lead to sustainable sheep production by minimizing reliance on anthelmintics.

*Chapter Seven* briefly discusses the results obtained in the above experiments in relation to the current knowledge on the use of alternative approaches and puts recommendations for future work.
in the area of parasite control in sheep with minimal reliance on anthelmintics.

**Published Papers:**


4. **Alem Kidane et al** Consequences of ewe protein nutrition and grazing on chicory on animal performance and parasitism. Proceedings of the 22nd International conference of the world association for the advancement of veterinary parasitology p16
